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**Environmental Strategy
Background Report**

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Khan

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Environmental Strategy Background Report

by

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Part I

Introduction and Background

Executive Summary

The following background study has been undertaken by the Sustainable Development Policy Institute (SDPI) in order to assist in the preparation of an environmental strategy for Pakistan. The terms of reference of the study are placed at Annex 1. The study is based on consultation with key stakeholders and the examination of recent experience as well as the broader context. The study has three interim goals:

- To provide a mechanism for assessment of existing environmental policies. In this context, it will aim to inform subsequent review and strategic efforts, most notably the exhaustive mid-term review planned for the National Conservation Strategy.
- To marshal expert opinion on priority issues; and
- To identify the key parameters for future action, including providing a framework for the review of the NCS, identifying priorities areas for investment by the World Bank, a framework for coordinating the actions of various actors, including government agencies, NGOs, the private sectors, and international donors, and guidance for developing proper indicators for monitoring.

1. Background

In 1992, Pakistan initiated two major environmental programs—the National Conservation Strategy (NCS) and the Environmental Protection and Resource Conservation Project (EPRCP)—both focused on capacity building and institutional

development, and the NCS in particular on the building of partnerships between different stakeholders.

Eight years have elapsed. While concrete data are not available, it is fair to say that over this period environmental institutions have become stronger, public awareness of environmental issues has increased, an adequate legal and regulatory framework has emerged (especially on pollution abatement, protected area management, and social forestry), and partnership and trust between stakeholder groups has grown. Indeed, the most outstanding contribution of the NCS process in particular is the coalescence of a vibrant environmental community in the country (many of whose members were consulted during the preparation of this report), as well as the emergence of a small number of effective and credible environmental organizations. Although it is difficult to say whether this is the best that could have been achieved with the available resources, the successes are commendable. On the other hand, and more disturbingly, notwithstanding eight years of operation of these two (and other supportive) programs, there is no evidence of an improvement in the state of the environment. Indeed, available data as well as casual observation suggests significant deterioration.

2. Opportunities and Constraints

This last point was repeatedly underscored in the stakeholder consultations, which also delivered a blunt piece of advice and warning. This is that the environmental program may fall into the trap that turned many earlier initiatives into mere paper exercises, increasingly divorced from the broader socio-economic context of the country, and without roots in the social and political realities or actual practices and behavior. To be meaningful and effective, it was stressed, strategies have to be grounded in the politics, the policies, the programs, the practices, the paradigms, the performance measures, and indeed the pathologies that preoccupy both the populace and the policy maker in the normal course of their lives.

Turning from the past to the future, while a few new opportunities have definitely emerged over the last eight years, far more prominent are new constraints and challenges. The most critical is the fiscal and payments crisis, which is compounded by the declining trend in international aid resources, both generally and in Pakistan's case, especially—in reaction to the military take-over and the nuclear tests—and the consequent slashing of the development budget. These constraints are somewhat counterbalanced by some favorable developments. These include new funding instruments (e.g., GEF, PCF, CDM) for environmental programs with global impact; increasing support for poverty eradication programs; growing market opportunities in clean and green products; and a much stronger movement to make transnational investment socially responsible.

The strategy proposed in the following pages has been formulated precisely in response to the above considerations. It seeks on the one hand to build upon the successes of the last decade, and on the other hand address problems that have emerged since—in particular to ensure that it remains grounded in the prevailing socio-political realities. The aim is to simplify the message and make it accessible to a broader constituency than has been mobilized hitherto, and make the program more manageable, more easily monitored, and more attuned to concerns that dominate the social, political, and policy agendas of the country.

3. Conceptual Framework

The conceptual framework proposed here has four key elements. First, it provides an explicit theoretical foundation for the consistent focus of Pakistan's environmental initiatives—institutional development and capacity building—through a loose adaptation of the successful model of **community development**.

Second, the extension of this model from local communities to national and sectoral programs relies on the concept of **policy communities**, namely networks of

individuals from government, private sector, or academia who collaborate (despite a divergence of interests) to determine policies in the areas of their interest and competence.

Third, while there are more policy communities than sectors—industry, agriculture, forestry, energy, water, health, municipal services, and so on—we propose a simplified structure that groups them into three categories—economic growth, poverty eradication, and quality of life improvement. Each represents a key societal aspiration, a major governmental objective and program, a different institutional base, and an alternative approach to the development process. The **tripartite program** proposed below—sustainable industrial development, sustainable livelihoods, and environmental health—is organized precisely along these three dimensions. Besides rationalizing the program, this will help ground the environmental strategy in the programmatic, institutional, political, and social contexts.

Finally, in the past insufficient attention was paid to the assessment of performance or the collection of data. Using the pressure-state-response framework, we propose three actions. First, support for an independent, annual publication on the *state* of the environment with a proper statistical annex. Second, the development of an indicator of environmental *impact* aggregated from indicators of impact on productivity, poverty, and health. Third, construction of an annual action-impact matrix to assess the impact of the *response*, i.e. macroeconomic and sectoral policies and policy reforms in the country.

4. Recommendations

The study makes four sets of recommendations:

- *Stay the Course*: Maintain the strategic focus on institutional development and partnerships, and incorporate it into all components and supporting structures.
- *Mainstream the Effort*: Orient the strategy toward mainstream programs and societal aspirations through a

tripartite program on sustainable industrial development, sustainable livelihoods, and environmental health, with appropriate sub-programs. For example, sustainable industrial development includes sub-programs on clean production and clean energy.

- *Invest in Support Systems:* Support the strategy through resource mobilization, technical assistance, education and research, and network development.
- *Monitor Performance:* Develop a framework for monitoring and assessment of outcomes. This should include an annual state of the environment report, regular collection and dissemination of environmental data.

Chapter 1

A Grounded Strategy for Sustainable Development

The following study has been undertaken by the Sustainable Development Policy Institute (SDPI) to assist in the preparation of an environmental strategy for Pakistan. It is based on consultation with key stakeholders and the examination of recent experience as well as the broader context. The study has three interim goals:

- To provide a mechanism for assessment of existing environmental policies. In this context, it will aim to inform subsequent review and strategic efforts, most notably the exhaustive mid-term review planned for the National Conservation Strategy.
- Marshal expert opinion on priority issues; and
- To identify the key parameters for future action, including providing a framework for the review of the NCS, identifying priorities areas for investment by the World Bank, a framework for coordinating the actions of various actors, including government agencies, NGOs, the private sectors, and international donors, and guidance for developing proper indicators for monitoring.

In this chapter, we introduce the salient elements of the argument, and in particular present the case for an environmental strategy that is more fully grounded in the socio-political realities of the day. The chapter uses this argument to recommend a three-pronged program whose three planks correspond to the mainstream developmental priorities of the government as well as explicit and well-recognized societal aspirations. The conceptual framework adopted here is a formalization of the thinking that lies behind most current environmental programs. This thinking is based on a loose adaptation of the model of community development that has proven

highly successful at the local level. In order to formalize the theoretical framework, and extend it from the local to national and sectoral levels, we invoke on the concept of “policy communities”, defined later in this chapter.

To support these arguments, we provide in Part II, a brief review of the available tools for the assessment of performance. These include an assessment of the availability and quality of environmental information (Chapter 2), the role of environmental indicators in improving and organizing this information (Chapter 3), and an action-impact matrix (AIM) to assess the environmental impact of fiscal and sectoral policies and programs of policy and structural reform (Chapter 4). This is followed in Part III, by a brief review of conditions in various sectors relevant to the conservation program. Finally, Part IV contains a discussion of the basis of the three-pronged strategy namely sustainable economic growth, poverty eradication and sustainable livelihoods, and the quality of life and environmental health.

The study has been developed through a process of review and consultation, including five brainstorming meetings—one each in Islamabad and the four provincial capitals (see Annex 2)—as well as direct conversations with leading environmental experts, policy makers, activists, and practitioners in the country. Successive drafts of the report were circulated to federal and provincial governments, World Bank staff, and key environmental groups in Pakistan, and were presented to and discussed with representatives of these agencies in formal as well as informal meetings.

1.1 The State of the Environment

To present the relevant background information on Pakistan, we rely on a "Pressure-State-Impact-Response (PSIR)" framework. This modification was developed by Rogers *et al* (1997) to include "impacts" in addition to the other three dimensions (Box 1.1).

1.1.1 Sources of Pressure on the Environment

The pressure on the environment comes from the growth of population, production, and consumption. Since independence in 1947, the Pakistani economy has registered a respectable rate of economic growth, whose impact on natural resources is multiplied by one of the world's highest rates of population growth. According to the latest population census, completed in March 1998, the country's population was 130.6 million, making it the seventh most populous country in the world (having overtaken Japan, Bangladesh, and Nigeria since 1991). The population growth rate is currently estimated at 2.61 per cent per year, which is the second highest amongst the ten largest countries. However, it is lower than the previous estimates of inter-censal growth during 1961-72 (3.7 per cent) and 1972-81 (3.1 per cent). The rapidly growing population has increased the pressure on resources generally. Population density has increased from 54 persons per square kilometer in 1961 to 164 persons in 1998. Similarly, the density per hectare of cropped area rose by 31 per cent, from 4.36 persons in 1981 to 5.69 persons in 1998.

Economic growth has added to the pressure on natural resources. Between 1982-83 and 1996-97, GDP at constant (1980-81) prices more than doubled from Rs 296.4 billion to Rs 646.0 billion, corresponding to an annual rate of growth of 5.6 per cent (*Fifty Years of Pakistan in Statistics*). This growth corresponds with the structural transformation of the economy, whereby the share of agriculture in value added declined from 30.26 to 25.38 per cent, while that of industry rose from 22.07 to 24.54 percent, bringing the two sectors close to parity. The most dramatic expansion took place in the energy (electricity and gas) sector, which increased fourfold, from Rs 6.02 billion (in 1980-81 prices) in 1982-83 to Rs 24.10 billion in 1996-97.

However, this growth process is widely criticized for being structurally unsound, socially inequitable and environmentally unsustainable. Structural problems emerged in the shape of declining savings and investment rates, persistent budgetary and payments deficits and deterioration in physical infrastructure. Social inequity is manifested in the depressed indicators of human development, rising

levels of income inequality, and periodic increases in poverty. A summary of the relevant data is presented in Box 1.2.

While environmental data is rather sporadic and variable—as we see below in more detail—evidence of widespread environmental degradation is mounting.¹

- Water availability has declined from a water-affluent level of 5,300 cubic meters per capita (m³/cap) in 1951, to 1,600 in 1991 and a borderline 1,200 today—barely above the indicator of water scarcity, 1000 m³/cap.
- Water quality is generally poor, and is believed to have worsened dramatically because of pollution from industrial, municipal, and agricultural sources. A recent survey by the Environment Department, Government of Punjab revealed that even under the WHO relaxed guidelines water from 10 of the 11 surface samples, and 2 of the 4 ground water samples was chemically unfit for human consumption (*Compendium*: Table A-98).
- Land degradation continues unabated, and roughly 38 per cent of Pakistan's irrigated land is reported to be waterlogged and 14 per cent saline.
- The application of agricultural chemicals has increased by almost a factor of ten since 1980 (*ibid*: Table C-13).
- Air pollution, mainly from suspended particulates, has become ubiquitous, and exceeds WHO guideline values in virtually every sample collected by provincial environment departments (*ibid*: Table A-105).
- The forest cover, already very low by international standards (at less than 5 per cent of total land area) is shrinking by 2.5 to 3.1 per cent and woody biomass by 4 to 6 per cent annually—the second highest rate in the world.

1 The following data is mainly from *The Compendium of Environment Statistics of Pakistan 1998*.

- Finally, extreme events and hazardous incidents appear to be occurring with greater frequency. Since 1992, floods have affected millions of people and damaged or destroyed thousands of houses, and millions of acres of crops virtually every year (ibid: Table B-28).

1.1.2 Impact of Environmental Degradation

The resource degradation listed above produces a number of adverse economic and human impacts. Degradation of forests, soils, and biological diversity adversely affects agricultural productivity as well as the tourism and other economic potential. Water pollution leads to waterborne diseases, and consequently impacts human health as well as aquatic life—and therefore fish catch, tourist and esthetic potential, and industrial equipment. In general, it affects the poor disproportionately, since they have lesser capacity to insulate themselves. Air pollution impacts human health adversely, through exposure to carbon monoxide, lead, suspended particulate matter, and oxides of sulfur and nitrogen. These chemicals cause cardiovascular problems, hypertension, heart attacks, and thus shortening of life and lowering the quality of life. Exposure to lead, particularly at an early age affects mental development. Air pollution also has economic impacts, for instance from poor visibility (which could induce traffic jams, airport delays, and even air and road accidents), and the impact on the urban flora and fauna.

The above conclusions regarding unacceptable levels of environmental degradation in Pakistan are supported by three recent empirical analyses, which show the significant human and economic costs, and the risk to long term sustainability associated with current growth trends.

Using conservative assumptions, World Bank economists, Brandon and Hammond (1995) estimate the annual health and economic costs of environmental degradation to range between US\$ 1,092 million and US\$ 2,080 million (i.e. between 2.6 and 5 per cent of GDP). These include health impacts of water pollution (\$759 million) and air pollution (\$301 million), and the loss of agricultural production due to land degradation (\$300 million). Another interpretation of this result is the “genuine net savings rate” of the

country—after accounting not only for the depreciation of physical capital, but also the degradation and depreciation of “natural capital”—is only 2.5 per cent of GDP. A low savings rate means the lack of adequate resources for investment and growth.

A somewhat different analysis was conducted by Mark Spoor (1997), who used recorded health and disease data to estimate the total burden of disease in Pakistan (including both environmental and non-environmental causes) to be 47.45 million disability-adjusted life-years (DALYs), or 36,500 years per 100,000 population. DALYs measure the number of years of healthy life lost per case of the disease, including both the time lived with a disability and the time lost due to premature mortality. Using Spoor’s data as a basis, a simple calculation (see Chapter 13 below for details) reveals that environmental factors are responsible for at least 45 per cent of the burden of disease, i.e. 16,350.4 DALYs per 100,000 population, or an aggregate loss of 21.18 million life years.²

An important observation made by Spoor is that despite the existence of a decent medical care system, Pakistan has not made the epidemiological transition through which the impact and spread of infectious and communicable diseases is checked. While his brief explanation of this failure is focused primarily on the limitations of the health care system, it could more readily be attributed to the inadequacy of environmental health—waste management, pollution abatement, and ensuring drinking water quality.

Finally, Peter Rogers and his colleagues estimate an alternative index, the cost of remediation (COR), namely “a measure of the increase in defensive expenditures that a society must undertake in order to leave to future generations environmental assets equivalent in quality to the ones the current generation received” (Rogers *et al*, 1997: 62). They argue that the COR provides realistic criteria for setting national environmental quality standards (NEQS), since it is difficult to justify NEQS whose remediation costs are higher than what is feasible, or what is averted (i.e., the cost of damage). Be that as it may, their estimate of the annual cost of remediation of environmental degradation problems in Pakistan is \$1,076 million

2 Spoor’s results are not directly comparable with Brandon and Hammond’s because of differences in coverage and assumptions. For details, see Chapter 13.

(1990 prices) or 2.57 per cent of GDP. This figure is not very different from the NCS estimate of the investment needed for conservation. Rogers *et al* also propose an order of priority for the country's environmental problems, with urban congestion and pollution at the top, followed by land and soil degradation, deforestation, water quality deterioration, marine and coastal resource degradation, rising sea level, industrial pollution and waste disposal (Rogers *et al* 1997: 142-144).

The upshot is that all three calculations of the impact of environmental degradation reveal significant and for the most part avoidable costs associated with the current pattern of economic growth and resource management. The annual cost of degradation are estimated at between one and two billion dollars, including the loss of at least 21 million life years; while the corresponding annual cost of restoration of the environment (and thus avoiding the bulk of these costs) is estimated at around one billion dollars. The issue is not one of whether it needs to be addressed, but rather of how it can best be addressed. This leads directly into the discussion of how environmental issues have been addressed thus far.

1.2. Environmental Policy Responses

This section reviews environmental policies—both targeted environmental policies and traditional fiscal and sectoral policies—to assess their impact on the environment, as well as their contributions and shortcomings. The impact of traditional fiscal and sectoral policies as well as structural and policy reform programs is discussed in more detail in Chapter 4, and will only be described briefly.

The substantive and coherent pursuit of environmental objectives can be dated back only to 1992, with the initiation simultaneously of two major programs of environmental conservation and capacity development. On March 1, 1992, the federal cabinet approved the Pakistan National Conservation Strategy (NCS), and on May 14, 1992, the government of Pakistan reached agreement with the World Bank and affiliated donors, for a technical assistance credit of US\$ 29.2 million for the Environmental Protection and Resource Conservation project (EPRCP). CIDA, which had supported the preparation of the NCS, also provided

support (C\$ 15 million) for the implementation phase of the strategy. These initiatives were followed by other important donor initiatives, including the EC-funded watershed rehabilitation project (included in the EPRCP), the Swiss and Dutch funded projects on sustainable industrial development, UNIDO-supported project on Kasur tanneries, and several sectoral projects supported by the ADB, NORAD, UNDP, and other donors.

After eight years of operation of these programs, there is not a visible improvement in environmental conditions. Indeed, as was demonstrated in Section 1.1, environmental indicators are on a downward trend. However, the changes introduced through these programs have helped lay the basis for a more effective strategy in the future.

1.2.1 The NCS

At the outset, it is important to distinguish between what Steve Marglin (1990) would call the *episteme* and the *techne* of these projects, their formal conception versus their practical application. The formal goal of the NCS is the transformation of attitudes and practices and the influencing of consumption patterns. To this end, it focuses on investment choices—"which are more flexible than consumption patterns" (IUCN 1992: xxv)—in order to transform of the way "development is undertaken, to ensure that it is not destructive of the natural resource base on which it rests" (ibid. xxvii). This translated into a proposed investment program of Rs 150 billion over ten years, equivalent to a doubling of the environmental component of gross domestic investment from its then current level of 4 per cent. The document also emphasized the need for policy and institutional changes, but did not specify them with the same degree of concreteness.

In any event, the expectation of a doubling of environmental investment turned out to be far too optimistic. As a result, the practical significance of the NCS document is not in terms of its stated goals. Rather, it lies in the framework it provided, the baseline information that was collected under its auspices, the model of participatory strategy development it introduced, and the network of stakeholders it mobilized. In addition, the implementation of the

NCS helped create and strengthen key institutions, and thus provided an opening for subsequent initiatives. These were, in a manner of speaking, incidental outcomes of the *techne* of the NCS, of its *process*, rather than its *episteme* or formal goals or structure.

1.2.2 The EPRCP

The aims of the EPRCP are twofold, to initiate the upgrading and strengthening of Pakistan's environmental protection institutions, and the rehabilitation of several watershed and rangeland areas. These aims were to be implemented separately, the first through direct support to federal and provincial environmental protection agencies (EPAs), and the second through sub-projects in selected areas. In practice, however, the main achievement of the project turned out to be in three areas: environmental awareness, institutional development, and legal framework development. Again, as in the case of the NCS, these successes can only be regarded as incidental outcomes of the *process*, not the pre-planned goals of the program. Indeed, both the NCS and the EPRCP claim credit for much the same successful outcomes, which are taken directly from the NCS Plan of Action 1993-98. While this suggests a welcome convergence between the two projects, it also raises questions regarding duplication of effort and the efficiency of resource allocation.

A common criticism of technical assistance programs is that they result from the desire of lending agencies to “push” their loans on cash-strapped governments without adequate regard for performance or return. It is difficult to escape the impression that the EPRCP technical assistance loan was driven, at least in part, by such concerns. The project appears to have been drawn up hastily. It had very few effective safeguards for performance assessment. Pilot projects were selected without adequate regard for their demonstration effect. Research and other resources were channeled through non-transparent mechanisms, and seem to have disappeared into the void. Institutional strengthening was conceived of simply in terms of payment of salaries and provision of equipment. Mass awareness was similarly conceived of in terms of expensive multi-media programs, although the major breakthrough may have been made through incidental and small-scale activities.

Besides this, the project could have benefited from greater coordination with the NCS and other environmental programs,³ clear output-oriented targets of performance,⁴ and greater transparency in decision making. Finally, major areas of capacity building were left untouched. For example, the main agency responsible for data collection and organization, the Federal Bureau of Statistics, was not included in the capacity building program.

1.2.3 An Assessment

To summarize, while the first phase of environmental action has not produced tangible outcomes in the form of a better environment, it has led to successes in certain areas, and especially in creating institutions and awareness as well as a platform for policy formulation. Its main achievement is the development of a policy framework, including the 1997 environmental protection act, the designing of the national environmental quality standards through a consensus building process, the agreement to levy a pollution charge on industry (thus giving substance to the polluters pay principle), the establishment of environmental tribunals, the formalization of the rights of citizens to protect collective environmental rights through the judicial system, and a framework for providing fiscal stimulus to environmental activities. It has helped enhance mass awareness of environmental issues, which is widely visible at all levels of society, although more so in younger people and among English-speaking groups.

More importantly, it has created a sense of goodwill and partnership between government agencies, the private sector, and the independent sector. While this would not have been possible without direct financial support to the government, the drive towards such action came from the independent sector and not from the

3 Especially the SDPI project on sustainable industrial development, which contributed significantly to policy development on industrial pollution and the reform of the NEQS.

4 For example, it is not clear whether the pilot projects can truly be regarded as “pilot” activities, in the sense of providing a model and guide for subsequent action. Most are not well known, and do not appear to have created a ripple effect.

government. Indeed, the institutional structures of the independent sector—including transparency, cooperation, participation, and continuity—were responsible for much of the success.

1.2.4 Stakeholder Perspectives

In this regard, it may be useful to list some of the recurring themes of the stakeholder consultations. There were repeated warnings and advice that the environment program was in danger of falling into the trap of self-marginalization and isolation. To be meaningful and effective, it was stressed, strategies have to be grounded in the politics, the policies, the programs, the practices, the paradigms, the performance measures, and indeed the pathologies that preoccupy both the populace and the policy maker in the normal course of their lives.

- **Pathologies:** Conservation is undermined by persistent social ills—poverty, illiteracy, malgovernance, population growth, gender inequality, and conflict—whose eradication must be integrated into the strategy. In particular, the report points to powerful synergy between environmental conservation and such traditional development goals as economic growth, poverty eradication, and quality of life improvement.
- **Politics:** Since conservation cannot succeed without political will, the strategy should seek to generate political support. This would happen only if the environmental programs speaks to the socio-economic agendas of the country.
- **Policies/Programs:** Conservation programs should not be prepared in isolation from or opposition to mainstream government policies and programs but should be integrated into them. They should be seen as relevant both to the developmental priorities of the government and the goals of the structural reform programs and fiscal and sectoral policies.
- **Practices/ Paradigms:** Conservation should build on how people actually cope, and the decisions people actually make on housing, wastes, biodiversity, or health—in the formal as well as informal sectors—rather than seeking to supplant existing practices with wholly new systems or high-tech solutions.

- **Performance:** Despite a decade of rhetoric, there was no visible improvement in environmental conditions or the quality of human life. Strategies should lead to visible and verifiable improvements in the quality of life, not only on the inputs into such processes. Assessment of performance should be an integrated feature of the strategy rather than an after thought.

Furthermore, it was suggested that the emphasis on institutional development should not be merely rhetorical, and should be reflected for example in the respect accorded to expertise and experience in capacity building,⁵ and acknowledgment and recognition of the success of various organizations in improving their institutional strengths and capacities.

Concerns were also expressed that strategies were reliant entirely on external resources from conventional sources, and had not paid sufficient attention to resource mobilization on a broader and more sustainable scale both within and outside the country.

To summarize, the pressure on the environment is increasing steadily, environmental indicators are worsening, and the resulting degradation is imposing severe human as well as economic costs. The response thus far has not managed to make a dent in this situation. However, it has helped lay the basis for a more effective strategy in the future. Yet, there are concerns that the strategy may become irrelevant and marginal unless it makes it a concerted effort to insert itself into the mainstream of developmental thinking. The strategy proposed below is intended to respond precisely to the above concerns.

1.3 A Conceptual Framework

The conceptual framework used in the following analysis has a number of independent yet inter-related ingredients.

- First, as was described above, this study relies on the PSR framework for organizing environmental information.

5 In many cases, it seemed to have been assumed that institutional obstacles could be removed through simple interventions (e.g., short training courses). See Jingfors (1999).

- Second, it seeks to render explicit the implicit framework adopted in the NCS as well as other leading environmental initiatives in the country. This framework is an adaptation of the model of successful community development programs. Under this model, the policy interventions are targeted at capacity development, which in turn is hypothesized to lead to desirable results.
- Third, in adapting the community development model from the local level—where it has registered its major successes—to national and sectoral levels, we rely upon the concept of policy communities.
- Fourth, we conceptualize the mainstream developmental agenda as an aggregation of three closely related components—economic growth, poverty eradication, and quality of life.

This four-part framework is described in the following pages. It has implications for the role of foreign resource flows, resource mobilization, and the development agenda.

1.3.1. A Model of Community Development

Existing environmental programs by and large use an implicit framework based on the model of community development and poverty eradication. The NCS as well as the EPRCP started with a strategic focus on institutional strengthening and the development of partnerships. This is also in keeping with the World Bank's new strategic approach to development assistance. While performance in these areas has been somewhat variable, the reason for this had more to do with the learning process and with an absence of clearly defined targets and monitoring systems, rather than a basic flaw in the strategy.

While the multitude of programs that use the community development approach is quite diverse, they have several key characteristics in common. The most important is that they focus not on the ultimate objectives, although they are important, but on the community—or, rather on the creation of collective *capacity* to achieve the ultimate objectives. Still, their performance is judged on the success in achieving the ultimate goal—e.g., poverty eradication.

Finally, they are acutely sensitive to the needs, concerns, strengths, assets, ways of thinking, and the strategies of the people themselves.

This model is implicit in conservation programs. The most striking example is the very focus of these programs on institutional development and capacity building. As in the community development model, conservation programs also sought to create the capacity to pursue the ultimate goals, assuming that once the capacity was created, the goals will be pursued automatically. This has been validated by experience. For example, the strengthening of IUCN has created an institution which is pursuing a diverse collection of environmental programs—in social forestry, protected area management, mangrove protection, strategy development, and others.

Second, it is implicit in the emphasis on network development—e.g., government-business roundtables, communication and media networks, and others. Third, this is an element of the participatory approach to policy development. Not only was the NCS developed through a participatory process, involving close to 3,000 people, this experience with participatory policy development was taken on as a permanent feature of the process. This was continued in several NCS-initiated actions, including the preparation of the UNCED report, the business government round-tables process, the sustainable development conferences, the IUCN members' meetings, the PEPC and its various standing committees (especially the Standing Committee on the NEQS), the preparation of the Sarhad Conservation Strategy, the program for sustainable industrial development, the various advocacy campaigns that emerged from time to time, and the consultative process used to draft the environmental protection act 1997. All these processes borrowed from the participatory community planning models used by community development organizations.

The community development model has a number of other features as well. The most important of these is that it sees investment in physical infrastructure as a basis for establishing a relationship with a community in order to induce them to become organized as a community and thus more able to make collective decisions. These decisions pertain generally to the sustainability of

the community—through savings mobilization, human resource development, and increasingly resource conservation. All of these are concerns that have been raised during the stakeholder consultations. In other words, it appears that at the basis of the concerns expressed by the stakeholder groups lies a conception of strategic intervention along the lines of the community development model.

However, the community development model has been applied mainly at the local level, such as a village or an urban neighborhood (*mohallah*), and its adaptation to a national or sectoral level is not very obvious. In practice, however, the model has been applied during the first phase of the conservation strategy in at least two different ways: as the strengthening of individual institutions/organizations; and as the strengthening of what could be called “issue networks” or “policy communities”.

1.3.2. Policy Communities

A policy community is defined as a network of individuals and institutions with interest and expertise in a particular area, and therefore a stake in the process of decision making regarding that area. It is based on the idea that policy-making is not a monolithic exercise located in one ministry or agency. It involves cooperation between governmental agencies—environment, finance, commerce, foreign affairs, energy, and agriculture—as well as non-government entities—NGOs, business associations, media groups. The decision making process invariably reflects the relative political influence of these groups and involves political negotiations and compromises between them.

The problem is compounded by the differences in the theoretical disciplines that unite or divide various issue networks. As a broad caricature, it might be said that the issue network over economic and trade liberalization consists almost exclusively of economists who are united by their partiality towards market solutions. The poverty eradication network is united around community development and institution building; the agriculture network consists of agronomists united by the green revolution's promise of maximizing yields per hectare; and the energy network was for long dominated by hydro engineers united by their support

for the Kalabagh dam and their faith in the unrealized potential of hydro power. Finally, the policy community around the urban agenda is united almost exclusively by the vision of real estate development.

At this moment, the largest recognizable group in the environmental policy network is that of community development NGOs. While there is a sprinkling of economists, agronomists, engineers, and foresters in the group, neither their numbers nor their commitment is sufficient to make inroads into other policy communities.

Furthermore, as has been argued by O'Riordan *et al* (1998), issues that are considered by governments to be on the policy periphery—like environment (or education, or health, in the 1990s, indeed even development)—are not easily factored into consideration of issues that are at the policy core—such as fiscal/ payments crises, national security, or mega-projects. The "issue networks" and "policy communities" around the environment ministries in most countries are shown to be weaker than those, say, around finance and defense ministries. In no country (and this explicitly includes Pakistan) has the environment been perceived within the powerful ministries and their policy communities as sufficiently threatening to their departmental interests to disrupt existing policy agendas. As such, all the other policy agendas continue to be designed with the environment at best as an after-thought.

Be that as it may, the purpose of invoking the concept of policy communities is to argue that the environmental programs have for some time tried to influence other policy communities—albeit with limited success—as well as expand and strengthen the environmental policy community. If this agenda is taken seriously, it will benefit from the application of the methodology developed by the experts of community development. As in the case of community development at the village level, this community needs to be recognized as a community, it needs a support program (similar to rural support programs), technical assistance, and an agenda for action.

To press the analogy further, community development organizations work with rural or urban communities and assist in strengthening their capacity for making collective decisions. Similarly, the environmental organizations need to work with various policy communities and assist in strengthening their capacity for

making sustainable decisions. Both need to understand the goals as well as practices of the communities they wish to assist, both have to have something to offer the communities, and both need to forge alliances with “motivators”—namely community members who support the aims and philosophy of the program. Finally, both need to realize that membership in a community does not imply identity of interests.

1.3.3. A Classification of Development Agendas

While there are many (or even more) policy communities as there are sectors, and while each sector corresponds both to a governmental program and a set of environmental concerns, it is possible to group these into three broad categories. These categories have a long history, reflect underlying societal aspirations as well as integrated goals and perspectives, and have large and fairly articulate intellectual and political constituencies. They have been pursued and championed by different groups, have faced different sets of obstacles, and have registered differential levels of achievement:

- **Economic growth:** industrialization, export promotion, and infrastructure development. This is the traditional growth agenda, which has focused mainly on the urban industrial sector, linked to the global market. Conventional wisdom about the support for this sector is a stable policy environment, a stable currency, and investment in communications and transport infrastructure.
- **Poverty eradication:** This goal has been championed mainly by the independent sector. The main approach for pursuing this is social mobilization, community development, and the support and protection of community rights.
- **Human Development:** This agenda has focused on a number of social sector variables—life expectancy, infant mortality, literacy, population planning, and access to services especially by women. This program has been championed by “alternative” economists, key UN agencies—UNICEF, WHO, UNFPA. These are often thwarted by the weakness of local and municipal institutions.

The aim is to link the environmental agenda to each of these goals, and thus on the one hand develop synergies between different programmatic objectives, and on the other hand, strengthen the environmental policy community. Before we discuss the agenda itself, however, two additional issues need to be touched upon. These pertain to resource mobilization and monitoring and assessment.

1.4. Resource Mobilization

Rogers et al (1998) estimate the costs of remediation, in Pakistan to be US\$ 1.076 billion annually (in 1990 dollars), or 2.57 per cent of GDP. This is likely to be a gross underestimate, since it does not include the costs of capacity building, policy and legal development, education and training, and mass awareness, nor does it recognize the fact that national statistics may underestimate the level of environmental degradation. Still, this estimate is not too different from the investment requirement worked out by the NCS. The NCS sought to double conservation-related investment from its trend forecast to Rs 300 billion over ten years. The total figure, at the then prevailing exchange rate (US\$ 1 = Rs 30) works out to US \$ 10 billion, or US\$ 1 billion annually. In other words, the NCS can be interpreted as saying that roughly half the required investment in conservation was already taking place through traditional programs of afforestation, rangeland and watershed management, drainage and land reclamation, and urban waste management. The remaining half, i.e. an average of US\$ 0.5 billion annually was needed to remedy existing problems and initiate the required transformation.

Actual additional resources available for investment in conservation have been no more than a small fraction of this estimated requirement. The EPRCP envisages a total investment (including the domestic component) of \$57.2 million over 8 years, or an average of \$7.15 million per year. The aggregate volume of all other inflows of foreign assistance are well below this figure. Furthermore, the bulk of these resources were earmarked for institutional development and capacity building, activities that are not included explicitly in most conservation budgets. The bottom line is that even if, as in the ideal case, a dollar of foreign assistance stimulates two dollars of private investment, the total investment

generated in the last 7 years would not be above \$50 million a year, or about 10 per cent of the net additional requirement.

These aggregate figures are helpful in bringing out the scale of the problem, and thus of the broader goals of a strategy. Second, they bring out the fact that a decent strategy would have to be based on leveraging these resources into a larger and more adequate volume of funds for environmental action. Finally, the figures are helpful in describing what is achievable with a smaller quantum of resources, and especially that unless the projects were concentrated in a limited sector or region, it would be unrealistic to expect them to produce a discernible impact on national environmental indicators.

1.4.1 *Opportunities and Constraints*

However, a number of new handicaps must be kept in view. First, the government's fiscal crisis has become steadily more acute. It is likely to remain so in the immediate future, especially in view of the international reaction to the military take over, and the residue of the reaction to the nuclear tests of last year. Furthermore, as is well known, foreign assistance is declining rapidly, both as a share of donor countries' GDP and in terms of the net flow of resources from rich to poor countries. In 1997, foreign aid fell to 0.22 per cent of donor countries' GDP. This is its smallest volume since first institutionalized under the Marshall Plan. In real terms, foreign aid from rich countries to poor is one-third below its level in 1990. Finally, the structural adjustment program and economic reforms package have limited the flexibility of the government to undertake new ventures—although the latter have begun to incorporate environmental concerns (see Chapter 4).

While aid shrinkage has been offset by a more than six-fold increase in direct foreign investment in this decade, Pakistan's domestic instability and geopolitical conditions have limited its ability to access these flows. On the other side of the ledger, however, new financial as well as market opportunities have begun to emerge internationally for environmental programs, and

domestically the capacity of civil society and private sector organizations has increased dramatically.⁶

As a result of the above trends, Pakistan's development budget has shrunk from a high of 7.5 per cent to about 2.5 per cent of GDP. Even this smaller budget is being allocated largely towards high-profile mega-projects. This means that neither development assistance nor the conventional programs of economic development are likely to provide the major impetus for environmental improvement. The environmental strategy has, therefore, to take a more innovative and strategic approach, and rely on other drivers for the system.

Instead of placing exclusive reliance on conventional sources, the strategy should seek to combine conventional and non-conventional approaches in innovative ways. Equally, the effort must be to identify areas in which change can be produced through policy changes rather than budgetary outlays. One source is domestic non-budgetary mechanisms. Examples are pollution charges (adopted by the FPCCI general body), user fees, and others. The strategy must outline the nature and potential of such resources, and guide action in mobilizing them fully.

Finally, globalization offers new possibilities as well as the constraints mentioned earlier. However, the new opportunities will provide an edge mainly to countries with strong institutional capacities. For several environmental goals, specifically those with global benefits, significant resources can potentially be mobilized from international sources. Funds for selected environmental projects could be tapped from the Global Environmental Facility (GEF), the Clean Development Mechanism (CDM) of the Kyoto Protocol, the World Bank's Prototype Carbon Fund (PCF), and possible support for capacity building under the proposed Millennium Round of the world trade negotiations. However, access to these is expected to be fairly restrictive and will depend on the (extremely unevenly

6 For example, IUCN has expanded from a small, centralized entity, managing 4-5 small projects, to a sophisticated organization managing a portfolio of over 20 large and small projects. Likewise, a number of rural development organizations (NRSP, AKRSP, and others) have expanded their capacity and reach.

distributed) capacity of implementing agencies to utilize such funds effectively and transparently. In Pakistan, only a few agencies have demonstrated such capacity. Given the potential size of this source of funds, however, a significant element of the strategy must be to support agencies (both governmental and non-governmental) that have already built up such capacity, and to replicate their experience in other organizations.

Globalization can also reduce costs of technical change (through easier access to technological information) and increase the demand for change (through changing consumer preferences, domestically as well as internationally). However, the net impact of these changes depends critically on the underlying institutional environment.

1.4.2 Impact of Foreign Aid

It is also important to examine how the efficiency of the increasingly scarce resources could be enhanced. Recent studies demonstrate quite convincingly that the effectiveness of aid depends upon the existence of conditions not normally incorporated into the analysis: secure property rights, the absence of corruption, respect for the rule of law, social safety nets, and sound macro-economic and financial policies (World Bank 1998).

A dollar of foreign aid can be considered to be effective only if it stimulates more than a dollar of investment. In the best cases, a dollar of foreign aid attracts two dollars of private investment, because aid increases confidence of the private sector, and helps to provide public services, such as education and infrastructure. On the other hand, in most cases, aid fails to attract additional private investment. Indeed, results from the 1960s showed that on average a dollar of foreign aid led to a net decline in domestic savings, and thus produced less than a dollar of aggregate (public plus private) investment.

This research also suggests that the menu of instruments available is larger than may have been thought. Besides financial resources, it also includes ideas, or knowledge, and the support for champions of reform. According to World Bank (1998), "Providing significant amounts of money has not made much of a

dent in poverty in countries with weak management. It is possible to assist development in countries with weak institutions and policies, but the focus needs to be on supporting reformers rather than disbursing money".

1.5. Monitoring and Assessment

A major failing of previous programs is the absence of clear targets and monitoring and evaluation of performance. This issue has been discussed in Part II (Chapters 2-4), which look at the availability of data, environmental indicators, and the environmental impact of policy reforms. The key recommendation is to publish an annual report on environmental quality, which includes an index of environmental quality, divided into appropriate sub-indexes. Such an endeavor will create the demand for data collection, and will facilitate ancillary research and analysis.

Finally, in keeping with the ethos of the program, the support system, including monitoring and evaluation, financing, and education and research needs to be oriented towards institutional development and partnerships. This would require setting up a system to assess progress (including a proposal to conduct a census of environmental institutions), investments in educational and training systems to orient them towards institutional development, and funding for research as well as core support of environmental institutions.

1.6. Mainstreaming the Environment

In order for the environmental strategy to achieve a breakthrough and acceptance, it has to be acceptable to the policy communities around the three goals identified above. The three components are, however, quite distinct, and require different policy and program approaches.

There are five broad conceptions behind this proposal.

- First, that the goal of environmental strategy in this phase must be the mainstreaming of conservation into traditional policy making areas. We have identified three broad areas of

policy making: economic growth (or export led industrialization); quality of life and human development; and poverty eradication and sustainable livelihoods.

- Second, that the economy is better viewed as the intersection of three very different spheres: the rapidly globalizing, corporate economy, built around exports, technical progress, and large scale investments; the human scale local economy, built around nontradable goods and services, which supports and sustains the corporate economy; and the increasingly marginalized and vulnerable livelihood economy of the poor in urban and rural areas. These correspond to the three social programs listed above. Environmental policies must cater to all three economies in order to be sustainable.
- Third, that around each economy, and indeed each sector of the economy, there is a “policy community”, which brings a framework of analysis, and an approach to intervention for the issues. The environmental strategy must be able to interact with each of these communities on their terms, and to assist them in designing more sustainable programs and policies. Included in the concept of the policy community is that of the key implementation agency, which ought to be the target of action. In the corporate economy, the target is the domestic and foreign corporate sector; in the local economy, it is the informal sector and the municipal agencies; and in the livelihood economy, it is the community organizations and their support group. The environmental program must be able to work through the appropriate agencies, rather than rely on entirely new or distinct institutions.
- Fourth, accordingly, the Ministry of Environment has to play three distinct roles. Its **regulatory** role in the industrial sector has to be backed up by its character as a **technical assistance agency** for the corporate economy, providing it with information on clean technologies, sources of funding and assistance, and access to markets for environmental friendly products. In regard to the livelihood economy, it has to play the role of a **support agency** for community development efforts, in order to empower and mobilize local communities to protect their natural resource base. Finally, in the local

economy, it has to play the role of the country's leading **public health agency**, undertaking research on the links between environmental degradation and disease, and building a strong constituency around the protection of human health. These three roles are described in somewhat more detail in the three chapters that follow.

- Fifth, that the three programs have to be accompanied by effective monitoring of the results through sustained data collection exercises. These data should be incorporated into three distinct “output oriented” indicators of sustainable growth, sustainable livelihoods, and quality of life. In addition, there should be an indicator of the capacity of institutions.

In all of these cases, it is recommended that the earlier focus on institutional development and capacity building must be maintained. This implies continued working through stakeholder groups, roundtables, and networks. It also means an active reliance on institutions that have the expertise and legitimacy in such actions. Just as the building of a dam or a bridge requires professional training and experience, and cannot be communicated through a two-week training course, the building of communities also requires extended knowledge and experience. If this knowledge is treated with the same deference as is accorded to other professional skills, the environmental program will be able to reap much larger benefits.

Behind this proposal is the concept that a strategy requires mobilizing support and identifying key actions that can lead to a self-sustained process of change. It also requires the capturing of the high ground in policy discussions. For this, it is imperative that environmental actions are seen as supportive of a larger societal agenda. While the links with the poverty eradication and quality of life agendas are quite self-evident, they still have to be communicated effectively. The links to the growth agenda are somewhat less intuitive. However, as has been argued in the following pages, the emphasis on the growth agenda has to be kept on export promotion, and support to productive enterprises for effective participation in the global economy. Such

participation can come only on the basis of clear and visible environmental management at the enterprise as well as the national level.

Second, it is recommended that in the next phase, the strategy be divided into three main components:

Sustainable Industrial Development: This is intended to interact effectively with the main economic strategy of rapid industrialization and export growth. This is the high-growth, dynamic sector of the economy. It has generally been regarded as the engine of growth, and is the major focus of economic policy making. Here, the problem is not so much to provide a subsidy or fiscal support to a sector that is already quite dynamic, but rather to establish a set of stable and credible guidelines that can provide incentives to private sector decision-makers to introduce sustainability considerations in their calculations.

In other words, the goal of the program is to make the export-led growth process sustainable, and conversely to make sustainability acceptable to the policy community around the growth agenda. This requires the creation of strong regulatory institutions, which need to be hooked into the one-window operation of industrial approval.

It requires the use of market-based instruments (e.g., pollution charge), and the provision of fiscal or commercial subventions in a predictable and non-discriminatory fashion. Such policies, both at the macro and sector level, fall into two categories. Win-win policies are those that improve resource allocation and create appropriate incentives for protecting the environment. Exchange rate liberalization, energy price decontrol, energy taxes and the rationalization of fuel distribution costs provide the right market signals for energy conservation. However, on balance, policies aimed at improving resource allocation have tended to be neutralized by policy distortions at the sector level. If such distortions continue to persist they can undermine the impacts of both economy wide and sector specific reforms. In addition, institutional reforms and emission-reducing policies are no less important than the need for pricing measures.

This plank would have two sub-programs: clean production (i.e., pollution abatement); and clean energy (including emissions abatement, switch to renewables, and energy conservation).

Sustainable Livelihoods: This program builds upon the recognition that natural resources and biological diversity of the country is largely in the rural areas, which are also the areas of the greatest poverty and institutional weakness. The goal of the program should be, therefore, to ensure that the environmental agenda is integrated into the poverty eradication agenda, and that natural resource conservation is combined with participation, social mobilization, and community development. It also includes the allocation of clearly defined property rights over natural resources, and strengthening of institutions for the defense and protection of those rights. This would also involve bringing participatory elements into new programs of protected areas development and sustainable agriculture. In many ways, all of this has already begun to happen, and community development NGOs have taken up environmental concerns and many environmental NGOs use social mobilization as a central feature of their approach. In particular, programs of social forestry, and water management have sought to use the same methodology as community development programs—albeit with variable success.

This plank should attract resources through ODA and technical assistance windows. While the structure of this program should be locational, it would include a number of thematic sub-programs: social forestry, sustainable agriculture, participatory protected area management, participatory water management, and energy security.

However, these programs need to recognize the important role of the informal sector. Again, the sub-programs in this area would be clean drinking water, effective sewerage disposal, and clean air.

Environmental Health: focusing on the health impacts on the population because of water and air pollution. The goals would be to provide clean water, sewage disposal, and clean air. This aspect of the environmental agenda has acquired increasing salience as air and water pollution have begun to affect health and morbidity especially but not exclusively of urban populations. Since these are the

traditional responsibilities of municipal agencies, and have often involved small point sources, and informal sector services, it has been difficult to make headway. This plank would link up with urban management programs, and programs of preventive health generally. Accordingly, a significant part of the interaction will be with municipal and local authorities, and with the informal sector. This component will entail the strengthening of national and provincial regulatory institutions, as well as municipal institutions to enable them to implement programs for clean drinking water, sewerage disposal, and clean air in partnership with the informal sector, the transportation industry, and the petroleum industry. This is a refinement of the traditional programs of urban development and social improvement.

These three areas are also the traditional brown, green and gray areas of environmental conservation. The above comments point out that they differ not only in terms of their environmental impact, but also of the institutions involved, the policy community around the issues, and the opportunities and challenges confronting policy makers. In the environment ministry as well, different components have gravitated towards these areas. The EPA system has gradually gravitated towards the brown areas and towards the identification of a sustainable path for industrial growth. The green areas are still led largely by NGOs, but the rural development agencies and the forestry programs are the closest to these concerns. The environmental health plank does not have a clear champion in the ministry, although the housing program would come the closest to it.

The above program needs to be supported in a number of different ways: finance, monitoring and evaluation, partnerships, and education and research. Box 1 provides a schematic design of the support system needed for the program. The strategy needs to identify conventional as well as non-conventional sources for financing strategic initiatives. The program also requires an agenda of research and action. In brief, this would include the following.

- Strengthening of the environmental policy community.
- Regular and periodic assessment of the environmental impact of economic and sectoral policies, with results to be placed at the service of the broader policy community. Ideally, this research should be conducted in the autumn, and its results made

available in January, to enable them to be incorporated into the budget making exercise.

- Investment in collaborative projects, involving the environmental policy community and other policy communities.
- Collection of data on environmental variables, in order to facilitate assessments.

Part II

Assessment of Performance

Chapter 2

Availability and Quality of Data

In the three chapters in this section, we discuss the assessment of the performance of the environmental programs. As stated in Chapter 1, while the purpose of the program is the creation of capacity for sustainable development, its test lies in its ability to actually generate sustainable development. Starting with the modified PSR framework (see Chapter 1), in this chapter, we discuss the availability and quality of data. This is followed, in Chapter 3, with a discussion of the aggregation of this data into indicators of environmental quality, and therefore as instruments for environmental management. Finally, Chapter 3, inverts the causality to examine the environmental impact of mainstream economic and sectoral policies. Together these three chapters provide an integrated approach to assessing the impact of environmental action, and thus to serve as a tool in the hands of policy makers.

2.1 Sources of Data

This chapter pulls together the available information under the heads of pressure, state, impact, response and capacity. Some data on environmental variables is collected directly by the Federal Bureau of Statistics (FBS). However, the bulk of the relevant information is collected and published by several other governmental agencies (see Annex-3.1 for a list of such agencies), partly to meet their planning, assessment and monitoring needs, and partly in response to requests from domestic or international sources. In recent years, the FBS has compiled the available data and published it in environmental compendiums. The following discussion relies mainly on the *Compendium on Environmental*

Statistics 1998 (hereinafter, the *Compendium*) for contemporary information, and the NCS and its background papers for earlier data.

At the outset, it should be noted that there has been a definite improvement in the availability of environmental data in Pakistan. In 1992, the NCS (GOP 1992: 269) criticized the nature and quality of the data in the following words:

"[T]he collection and presentation of environmental statistics are still at a rudimentary level in Pakistan, characterized mainly by raw physical data relevant only to the department doing the assessment. Time series, where available, are usually even more limited to the physical or monetary inputs made by the agency in 'developing' a natural resource. Numeric data related to the sustainability of resource use are most rare."

While much of this criticism is still valid, the 1998 *Compendium* shows considerable improvement over earlier publications. It reports data on fuelwood consumption (p. 113), energy consumption by fuel type (pp. 143-4), drainage facility by type, noise level, emission of CO (p. 172), and clouds and precipitation (pp. 313-25). Even NCS data is reported for solid and liquid waste discharges (p. 200) and underground water contamination (pp. 201-2), and sector wise air pollution (p. 202); and pre-NCS (1980) data for housing and housing facilities (pp. 61-71).

However, there is still a long way to go. In particular, the *Compendium* does not appear to have been screened for quality—namely internal consistency, reliability, comparability, comprehensiveness, public availability, and representativeness.⁷ Data series are presented without question or comment, often in an uneven fashion, with little or no effort to

7 This is broader problem, since the quality of many officially collected statistics is quite variable. Pakistani data that is accepted as meeting at least the minimum criteria for quality include the Census, annual surveys (PIHS, PDHS), and the traditional data collecting arrangements (especially agriculture departments and WAPDA).

make them consistent either internally or externally.⁸ Most comes from sources that are sporadic, derivative and irregular—compiled on an ad hoc basis from project information,⁹ published sources, sample surveys or independent studies conducted for other purposes—and therefore difficult to assess or compare.¹⁰ Even data collected specifically for environmental objectives is incomplete,¹¹ and pertains to partial areas or limited (or undefined) periods.¹² The relevance of some data is limited by its scope, e.g. it may pertain to inputs rather than outputs—number of saplings planted rather than number of surviving trees—or to legal rather than biological definitions.¹³ The validity of some data is affected by conflicts of interest or other biases; Peter Hardi (1998) suggests that government departments often collect data not to measure the quality of environment but to show progress in their field.¹⁴ The value and quality of data is also affected by its accessibility to the public. Some information is not available for public use (and occasionally even for the use of the agency

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- 8 For example, the trend data on pesticide use shows dramatic growth from an unbelievably low level in the early 1980s. This could just be an artefact of increased coverage, but is reported without comment or explanation.
 - 9 For example, tree cover in a watershed management project, effluent quality in a pollution control project.
 - 10 Regular collection of data, e.g. through annual or more frequent surveys, allows an improvement in quality through learning by doing, as well as growing professional confidence in its value.
 - 11 For example, there is no national-level data on migration, resource consumption, industrial emissions, solid waste generation and management, age of vehicles on road, density of forests and their potential for sustainable yield, drinking water quality, or degradation caused by military activities.
 - 12 For example, land classification data is presented without a date. Similarly, data on wind and water erosion impacts is presumably an average for 1965-88.
 - 13 The example mentioned earlier is that of forest data, which is defined not in terms of the number or type of trees, but on the area controlled by the Forest department. Although the excellent HESS study corrected this, the official statistical publications report both types of information without a warning.
 - 14 This is particularly true of project data, including supposedly “independent” performance reviews, which are generally collected by or on behalf of the project staff.

collecting the data), and is therefore not subject to professional scrutiny.¹⁵

2.2 Quality of Data

Looking at the available data more closely, the most reliable information is on socio-economic variables, which refer mainly to the **pressure and impact** dimensions of environmental data. Data on the sources of **pressure** on the environment includes traditional economic and social activities—production, distribution, and consumption of goods and services; and the growth, distribution, and structure of population—as well as more detailed information.¹⁶ Information on **impacts** (both intermediate and ultimate) pertains to variables of ultimate public and policy interest. These include economic productivity, quality of human life and human health, poverty, and the frequency and probability of extreme events.

- Economic variables, including GDP, trade statistics, industrial and agricultural value added and aggregate consumption are collected and published annually by the Federal Bureau of Statistics. These are of reasonable quality.
- Data on population and housing comes directly from the 1981 Census and the periodic Pakistan Integrated Household Surveys (PIHS). However, while the Census data are quite robust, comparative work will have to wait until the full results of the 1998 Census become available.
- Data on social statistics and especially on health-related variables comes from the Pakistan Demographic and Health Surveys (PDHS), and the National Health Survey of Pakistan.

15 The worst example is the HESS database, which has still not become available for research apparently because of arbitrary, security-related restrictions on data from satellite or aerial photography.

16 For example, the number of vehicles, consumption of pesticides and fertilizer, energy production (by type of fuel), the volume of refrigerator production, the size and number of industrial units, emissions of various pollutants, greenhouse gas emissions, and so on.

In the absence of direct information on state variables, the above data are often used as proxies. For example, knowledge about the size, number, and type of industrial units can be used to infer the volume of industrial emissions and therefore the ambient water quality in industrial areas. Also, since this information pertains to social and economic behavior rather than to the natural resources directly, it draws attention to the need to modify behavior.

2.3. Data on the State of the Environment

The data most commonly referred to as environmental information is on the **state** or condition of various environmental resources. It is divided, conventionally, into brown, green, and gray sectors, referring respectively to industrial pollution, natural resources, and municipal waste. It includes ambient air quality (concentrations of SO_x, NO_x, CO, PM₁₀, etc), water quality (BOD, COD, TSS, TDS), forest area, threatened and endangered species, degraded (e.g. waterlogged, subject to erosion) lands, greenhouse gas concentration (not emission) in the atmosphere, and so on.

Data on **brown and gray** areas had occasionally been collected in the past, but it was neither regular nor very reliable. Information on selected variables was collected for the NCS during 1988-90 and on a broader range by environmental agencies in 1997-98. While it is fairly reliable, it does not provide a complete picture, and is reported in an uneven format. The variables monitored include:

- Key air pollutants (CO, SO₂, NO_x, SPM, Ozone) in selected urban locations. Earlier information on a smaller subset of air pollutants was collected for the NCS.
- Chemical and organic contaminants in urban drinking water, major watercourses (Kabul, Ravi, and Indus Rivers) and waster water drains. While comparable earlier data do not exist, some information can be gleaned from site-specific work conducted by various government agencies.

- Content and volume of solid waste generated in major urban concentrations. Again, neither comparable earlier data, nor information on waste disposal is available.
- Coastal pollution.
- Noise levels in an urban location in Lahore.

Good baseline data is available in the **green** sector but in some cases it needs to be supplemented with more recent estimates in order to enable comparisons.

- While the forests departments routinely collect and publish data on forest cover, it is not very reliable.¹⁷ The main source of authentic data on forest cover, consumption of wood (including as fuel wood), availability of woody biomass, and energy consumption is the Household Energy Sector Survey (HESS) conducted in 1992.¹⁸
- Periodic data have not been collected on soil degradation, soil organic content, agricultural run-offs, persistence of organic pollutants, or the consequent water quality deterioration. However, the Soil Survey of Pakistan provides reliable information on the classification of soils according to quality and use (Table 3.4). The volume of agricultural chemicals used helps as an indirect indicator of the soil quality. The annual agricultural surveys of federal and provincial ministries of Food and Agriculture provide fairly reliable estimates of agricultural inputs, and rough classification of soils. Finally, WAPDA publishes regular information on water availability as well as waterlogging and salinity.
- There is no domestic mechanism to assess biological diversity on a regular and periodic basis. However, information on the status of various species is presently available through IUCN's Red Book.

17 The problem is that forest departments traditionally define a forest as the "area under the control of the forest department".

18 This is also the source for the data supplied by the Forestry Sector Master Plan (FSMP) and the Biodiversity Action Plan (BAP), although the plans also use data published routinely by forestry departments.

2.4. Concluding Remarks

A fourth class of information is on policy **responses** by governments, including ameliorative investment, macroeconomic and trade policies, institutional efforts, and so forth. This information is useful partly as a gauge of the seriousness of the political commitment, and thus as an assessment of the prospects of improvement. The information and analysis regarding the “response” variables is assembled in Chapter 4 below.

The last point brings out yet another dimension of information that might be needed. In addition to pressure, state, impact, and response, it would be useful to have information on **capacity**. The assessment of the prospects for improvement depends not only on the political commitment of the government, but also on the capacity for implementing policies and ameliorative actions. These include capacity for regulation and policy-making (mainly in the government), monitoring and research (both government and the independent sector), implementation of projects and programs (government, independent sector, and the private sector), and supply of environmental goods and services (market).

Finally, it is also worth noting here that while the *Compendium* follows the modified P-S-R framework, the particular data compiled under each of these headings is rather haphazard and without adequate regard for its relevance for the end-user. Future publications will need to organize the data within each heading around clearly recognized sub-themes. Some ideas on this issue are provided later in this chapter. They should be pursued in collaboration with various end-users and stakeholders, including the ministry of environment and leading environmental NGOs and research organizations. However, an indicative list of sub-themes is given below.

- **Pressure:** Growth of GDP, consumption (aggregate as well as key items—timber, fuelwood, paper), investment, population, urbanization, infrastructure (energy, transportation), industrial production and emissions (again, with information on key sectors—paper, leather, chemicals, food processing, textiles), agricultural production and inputs (especially chemical-intensive crops—cotton, vegetables, fruit).

- **State:** Grouped according to natural resources—air, water, land, forests, biological diversity.
- **Impact:** Grouped into four broad areas: impact on economic productivity, human health (and quality of life), poverty, and extreme events.
- **Response:** Macroeconomic (fiscal plus trade) policies, structural adjustment programs, sector policies, economic development (and investment) policies, human development policies (education, health), poverty eradication policies and programs, and institutional development policies.

The most obvious way of ensuring the collection of good quality data is to create a demand for such data, and to enable the users of the data to interact with the data collection agencies over time. These issues are discussed in Chapter 3.

Chapter 3

Indicators of Environmental Quality

The map is not the territoryKorzybski

This chapter asks how the various elements of environmental data can be organized into a coherent index or indexes and thus made more accessible and meaningful for policy makers and citizens, and rendered more effective for performance monitoring. The construction of indexes also helps provide feedback and guidance to data collection agencies. In this regard, we examine three prominent alternatives: the index of environmental quality, the cost of environmental degradation (including the burden of disease), and the cost of remediation. To this end, we will take a supply and demand approach to environmental information.

Our main recommendation is that the environmental indicators in Pakistan need to be linked directly with the three goals of the environmental strategy, namely sustainable industrial development, sustainable livelihoods and poverty eradication, and environmental health. Second, the government should decide on a set of indicators to be published every year, and should sponsor supporting research and data collection. The indicators selected should not be changed for some time in order to allow an adequate database to be built up. Third, given the thrust of the program on institutional development, a separate indicator and supporting data should be constructed on this aspect of progress.

3.1 What is Environmental Information?

"Information" is not the same as raw data. It has to be processed and organized and made useful for the policy maker, the manager, the technical expert, or the citizen. However, the quality of the processed information—namely its reliability, representativeness (or unbiased-ness), periodicity, and

comparability—can not be better than the quality of the primary data.

Primary data (e.g., water quality data from various point sources, organic content of soils at various sample points, and so forth) is too numerous and scattered to be of use to anyone except the statistician. Most published information is **processed** or organized for certain purposes (e.g., average water quality in various localities of Lahore, average organic content of soils in different regions). Higher levels of aggregation or organization produce **indicators** (e.g. area under forests, water quality indicators), and **indexes of environmental quality**. The latter aggregates the indicators to produce one (or a small number of) figures that communicate to the policy maker or the citizen the impact of environmental quality on welfare, equity, productivity, or other variables of common interest.

The ultimate **demand** for environmental information comes from the public, NGOs, the media, donors, government regulators, and government policy makers, all of whom need it for different purposes—awareness, monitoring, decision making, and measurement—and therefore require different levels of aggregation or refinement. While citizens and political leaders are interested in the ultimate impact of degradation—e.g., on human health, growth prospects, or poverty—technicians, managers, and researchers are interested in more detailed information. Project managers would be interested in project related information.

One way of identifying the demand for information is from the bottom up, namely by asking people directly. Peter Hardi (1998) adopted such an approach in the context of his work for the Sarhad Conservation Strategy. He used a participatory methodology to identify the variables of interest, listed the information needed for this purpose, and compiled an excellent database of the available information, together with an assessment of its periodicity (and quality), as well as the institutions that collect such information.

Alternative approaches either adapt existing systems or structures of information, or use *a priori* reasoning to infer the data requirement for decision making. The index best suited to this need is one that gives the **impact** of degradation on variables

of policy interest, and thus enables the assessment of the aggregate costs of degradation, the trade-off between various courses of action, and pros and cons of alternative policy choices. Broadly speaking, there are three approaches to the construction of such an index. The common approach seeks to measure the costs of degradation along a given number of dimensions. This may include an index of the burden of disease. An alternative approach measures the costs of remediation, namely correction of the damage through policy intervention. A third approach is to use some other form of aggregation—such as caloric throughput—to construct an index of environmental health

3.2 Index of Environmental Quality

A useful and detailed description of environmental quality indicators and their data requirement is provided by CIDA (cited in Rogers et al 1998). The schematic diagram of the Canadian approach starts with an aggregate environmental quality index, which is composed of four sub-indices, one each for air quality, water quality, land quality, and miscellaneous aspects. Each sub-index is constructed further from constituent sub-sub-indices. For example, the index of land quality is an aggregation of indices on forests, overcrowding in cities, eroded rural areas, access to parks and parkland, strip mining, and sedimentation. The forestry index in turn is based on information on forest resources, forest fires, and insect and disease damage. Similarly, the urban air quality index (Index of specific pollutants) is based on data on CO, SO₂, NO_x, SPM, haze, and oxidants.

The Canadian indices, quite understandably, are designed according to Canadian priorities and Canadian conditions, and will not be applicable directly to the Pakistani situation. However, their structure of index formulation is fairly universal, and is quite similar to the recommendations made by Hardi (1998) or those designed for reporting to the UN Commission on Sustainable Development.

In the integration process, one analytical problem is of defining a *numeraire*, namely a unit of measure that allows comparisons between and aggregation of many different

components, and a second is of converting everything into the units of that *numeraire*. The most obvious *numeraire* is money, which also allows comparisons to be made with GNP. However, the conversion of environmental degradation into monetary terms is not necessarily straightforward. In fact, it can only be based on a deliberate theory of the cost of the degradation. In some cases, e.g., deforestation, this cost can be derived directly from the value of the assets foregone. Even here, there are problems of how to value forests properly, how to account for the esthetic, common property, or subjective value that people might place on forests?

The problem is even more acute in the case of pollution. Here, the costs are the loss of human health or human life, and the impact on biological diversity, habitats, and the integrity of ecosystems. It is not easy to convert these into monetary terms. As mentioned, the standard technique is to focus only on the first of these items, and to assess the impact of the pollution through disability adjusted life years (DALYs), which are then assigned monetary values. But this is extremely problematic, since it brings in a range of ethical and cultural concerns. In particular, there have been several objections to attempts compare the value of different human lives. For example, the Second Assessment Report of the Inter-governmental Panel on Climate Change (IPCC 1997) was criticized when one of its chapters, drafted by a team from industrialized countries, suggested that the value of one American life was several multiples that of an Indian life.

Be that as it may, attempts to sidestep this problem have invoked alternative *numeraires*—e.g., the footprint concept (Wackernagel and Rees 1995) uses acres of land, and others use energy flows or calories—but they do not escape the fundamental problem of comparing things that cannot be compared.

The most common approach is an index of the human and economic costs of environmental degradation. This would be equivalent to the costs of inaction (and by implication the environment-related benefits of action) on environmental conservation. These costs can be contrasted with the non-environmental (i.e. economic and political) costs of environmental action. Aggregated together, these costs and benefits can be

converted into an index that provides an overall picture of the economy.

Carter Brandon (1995) who estimated the health and economic costs of environmental degradation constructed such an index for Pakistan. He estimated the annual costs of degradation to range between US\$ 1,092 million and US\$ 2,080 million (i.e. between 2.6 and 5 per cent of GDP).

The estimates of the impact of pollution on human health are based on DALYs (disability adjusted life years), and their relationship to particular diseases. Another approach is to estimate the impact on human health directly in terms of DALYs, rather than seeking to convert it to dollars through inappropriate or indefensible assumptions. However, this would limit the analysis to only one domain and exclude the direct economic costs from the analysis.

The COR is another attempt to sidestep the valuation problem, but it does not succeed in overcoming it altogether. Since it is calculated primarily from technological and economic variables, it is supposed to be based on "objective" information, and not on subjective inter-personal comparisons or questionable assumptions about the value of a human life. However, matters are slightly more complicated, since this approach also involves a few simplifying assumptions that could be challenged. These include the assumption that technology is static and uniform, and that the differences between countries in their environmental standards are legitimate. The last assumption implies different values of human lives for citizens of countries with different standards.

As argued earlier, it is useful to conceive of the aggregate index of environmental quality in three dimensions, namely its impact on economic productivity and the potential for growth, its impact on poverty and sustainable livelihoods, and the impact on the quality of life. Such an exercise can also be summarized in the form of environmental elasticities. These can be defined as the ratio of a one per cent change in economic productivity, poverty, or the quality of life to a one per cent change in the appropriate indicator of the state of the environment or of a particular environmental variable (e.g. air or water pollution). The

dependent variables can also be measured in alternative ways to accommodate alternative perspectives and concerns. For example, the quality of life could be measured in terms of the HDI, or of infant mortality, morbidity, or some such.

The data required are broadly similar in nature to the case of air quality, namely the concentrations of known chemical and biological pollutants in drinking water and surface waters. These include BOD, COD, TSS, TDS, acidity (pH level), organic contamination (mainly e.coli), and hazardous metals (chromium, lead, mercury).¹⁹

Be that as it may, the point is that none of the indexes is perfect. Each requires some unjustifiable assumptions, and has to be used with caution. However, the value of indexes increases with use, since people acquire a better sense of the value of information it represents.

The important step is for the Ministry of Environment to decide on a suitable indicator or indicators that they would publish and report regularly, so that researchers, government officials, planners, and activists can begin to use it. By using it, they would gradually get a feel for the value of the information it contains. More importantly, once this is decided, it can guide the Bureau of Statistics in collecting the appropriate primary information, and refine this also over time. The above details would be useful for the Ministry of Environment and the Environmental Protection Agencies to decide on the appropriate indicator(s) and also to assess how they wish to present aggregate information on environmental quality before policy makers and for general public consumption.

Accordingly, we recommend that the Ministry announce three environmental indicators, which index the impact of environmental degradation (or equivalently, the cost of remediation) in three dimensions: productivity and growth; quality of life; and poverty and sustainable livelihoods.

19 While industrial pollution and agricultural runoff is included in the ambient water pollution, it is useful to mention these two separately, since they affect specific populations (industrial workers, cotton pickers), and are caused by specific groups.

- The first indicator addresses issues of economic productivity explicitly. An obvious component is land degradation and land productivity; including deforestation, loss of fisheries, and possibly the impact on export revenues.
- A second indicator addresses quality of life issues. Its focus is health-related impact of air and water pollution, and equivalently, the costs of remediation;
- A third indicator is in terms of poverty and sustainable livelihoods. Its components include the loss of biological diversity, fragile areas, environmental hazards, and increased vulnerability.

3.3 Institutional Information

In addition to the above three indicators, there is a need for a fourth index of environmental action, namely one that brings out changes in institutional capacity for the environment. Both the major environmental projects, the NCS and the EPRCP, seek to enhance capacity and institutional strength. This is entirely appropriate, given the conditions in the field. However, this focus also requires a mechanism for assessing whether the investment is being used effectively. In other words, there is a need for indicators of capacity development.

Indeed, it is quite surprising that the volume of resources and effort invested in capacity building is nowhere matched by the effort in means of assessing the effectiveness of such efforts. Most loans and grants in this regard appear to be based simply on the faith that the provision of financial resources would somehow magically strengthen the capacity of receiving organizations. More importantly, it is also believed that the capacity building of selected organizations is an end in itself, and is not meant to induce positive synergies in other institutions (or in the economy at large).

Some efforts at the project level have been made in this regard by CIDA in introducing the concept of Results Based Management (RBM). This exercise, which was undertaken jointly with all partners of the Pakistan Environment Project (PEP)—though, sadly, excluding CIDA itself—has sought to focus attention on indicators for the evaluation of performance of institutions being

supported. This is a useful approach and could be employed in other projects as well. However, this too is not enough. This methodology is aimed at relating capacity to outcomes and results, and not at assessing the performance of capacity building investments.

More importantly, it does not address the broader problem of economy-wide impact of capacity building efforts. Given that many diagnosis of environmental degradation cite institutional weakness as one of the major contributors, monitoring systems should enable policy makers as well as funding agencies to assess whether the situation in this regard was improving as a result of their investments. Indeed, such information might provide a better assessment of the overall impact of the investment. Unlike RBM, whose objective is to assess whether the institutions being supported are effective in what they do, the goal of the aggregate exercise is to assess whether the results produced by the intervention are sustainable over the long term.

There is a precedent for such an approach. The major source of funding for environmental projects, the Global Environment Facility (GEF), after experimenting with a number of other indicators of the overall impact of its activities in project countries, finally opted for what is best described as a key dimension of capacity building—market development. This indicator provides an excellent framework for assessing the sustainability of the results of the investment.

Market development pertains to the indirect impacts and sustainability of a project, measured in terms of changes in markets—supply and demand conditions, sales volumes, range of goods and services, etc. The idea is that the direct impacts of GEF projects—specific project outputs—are much less significant than indirect impacts, which ripple out in space and time, or among institutions to affect the market in a geographically broad, long-term, and/ or institutionally diverse manner (see Martinot 1998). The projects should be deemed to be successful only if the demand generated by them induces a supply response, such that the goods and services required for the sustained pursuit of the broader project goals begin to be provided in larger quantities and at lower costs.

The point about institutional capacity deserves emphasis for another reason as well. The emerging consensus over the importance of capacity building does not seem to have led to a better understanding of its complexity. While it has almost become a shibboleth in development circles, it continues to be treated in simplistic terms. Project documents and funding agencies appear to believe that community development and social mobilization will happen simply if it is included in the list of objectives of a project. The vast experience gained in Pakistan (and elsewhere in South Asia) in this regard, and in particular the need for appropriate expertise does not appear to have registered very well.

Since the inception of the NCS and the EPRCP, the size and sophistication of environmental organizations has increased dramatically. These organizations come from the government sector (MoE, PEPA, PrEPAs, P&D Departments), the NGO sector (IUCNP, SDPI, Sungi, SCOPE, Shehri, Shirkatgah), commercial consulting services (HBP, NMC, Halcrow Pakistan, Asianics), and among business associations (environmental cells in chambers of commerce and industry). To give details on perhaps the most dramatic instance of growth, IUCN-Pakistan was a small “family-type” organization in the early 1990s, with about 35 staff members in 3 offices, managing a small project portfolio funded mainly (90 per cent) by CIDA. In less than a decade, it has grown into a corporate organization with 260 staff members in 5 offices, a project portfolio of close to \$100 million, diverse funding sources and clients, and extensive outreach in the federal government, most provincial governments and NGOs, and increasingly among business associations and municipal level governments. It is one of the few organizations in the country with the institutional and financial capacity to manage medium to large projects (say \$ 5 million). Growth in other environmental organizations was similar though not as dramatic

A second area that deserves attention is the increase in supply and quality of environmental goods and services. For example, in the early 1990s, most EIAs had to be conducted with foreign expertise. Today, several domestic institutions and individuals can provide this service. Similarly, technical knowledge and expertise

about a range of environmental services has expanded. These include environmental auditing, environmental training programs for industry, home insulation services, organic agriculture consultancy services, government and NGOs, air quality testing, and others. Some agencies that possessed the skills or equipment for providing such services have now begun to offer them more explicitly. These include the National Institute for Biological and Genetic Engineering (NIBGE), Pakistan Institute of Science and Technology (PINSTECH), and various centers of the Pakistan Council of Scientific and Industrial Research (PCSIR). Similarly, while concrete data are not available, the common perception is that sales of environmental goods and services have registered an increase.

There should be a mechanism to monitor these trends. For this purpose, a useful approach would be to construct a periodic **Census of Environmental Organizations**, along the lines of the Census of Manufacturing Industries (CMI). This database can bring out information on size of institutions (staff strength, annual budget, number of projects managed, diversity of funding, technical qualifications of staff, nature and quality of services offered, diversity of clients, and others), and sales of environmental services.

Of particular interest in this regard is an assessment of organizations that have the capacity to handle large projects. This is critical, since such capacity can help partly offset the financial resource constraint. A number of international environmental programs can receive grant funding and even technical expertise, but in order to do so, they have to be sponsored and implemented by credible domestic agencies. Such capacity requires time and investment to be developed, and there is considerable scope for learning and transfer of experience from successful agencies in this regard.

It may also be mentioned here that the development of such capacity has not been pronounced in the government sector. The reasons for this are widely believed to be the poor service conditions in the government, including low salary levels, high degree of insecurity, frequent transfers, arbitrary and ad hoc policy making, and neglect of merit and expertise. Whatever the reason,

the fact is that very few government or government-owned institutions have the credibility to handle money or implement large programs. It is important to reverse this trend, but this will not happen simply by giving grants to government agencies or channeling resources through them. One possible alternative that has been tried with a modicum of success is the twinning of government agencies with effective non-government organizations, as in the case of the NCS.

3.4 Recommendations

Some of the key recommendations emerging from the analysis are presented below.

The main recommendation is that the Ministry of Environment should choose a set of indices of environmental quality, in order to determine the kind of report it would like to present to the people of Pakistan. This choice would help guide the data collection efforts by providing a clear goal.

In this report we have recommended the choice of the cost of environmental degradation as the appropriate index. However, in accordance with the strategic thrust of this Report, we propose that the costs be described along three dimensions—economic growth and productivity, quality of life, and poverty and sustainable livelihoods. These will bring out the costs in a manner that can be understood readily by the policy makers and the public. They will provide a *raison d'être* to the work of the ministry and its affiliated agencies. Finally, they will bring out the human cost of the environmental damage, and thus create social awareness political will for the conservation effort. In addition, we also propose the collection of data and publication of an index of institutional capacity.

Having said this, however, it must be admitted that the specific index chosen is less important than the decision to choose an index, any index.

Second, the Ministry should decide to put together an annual report on the state of the environment. This report should present the above analysis on the cost of environmental degradation. In order to have credibility, this report should, however, be presented by an

independent agency, on behalf of an environmental consortium. The report should be presented in a public forum, such as a conference and be subjected to advice or criticism.

Third, the annual report should contain a statistical appendix with time series data on environmental variables. The Federal Bureau of Statistics should prepare the statistical compendium at the behest of the Ministry and its partners. The compendium should be organized around the needs of the report and not the other way around.

Fourth, for this purpose, the Federal Bureau of Statistics should receive pilot grant to incorporate the collection of environmental statistics in its standard survey processes, including the PIHS, PDHS, HIES, and others.

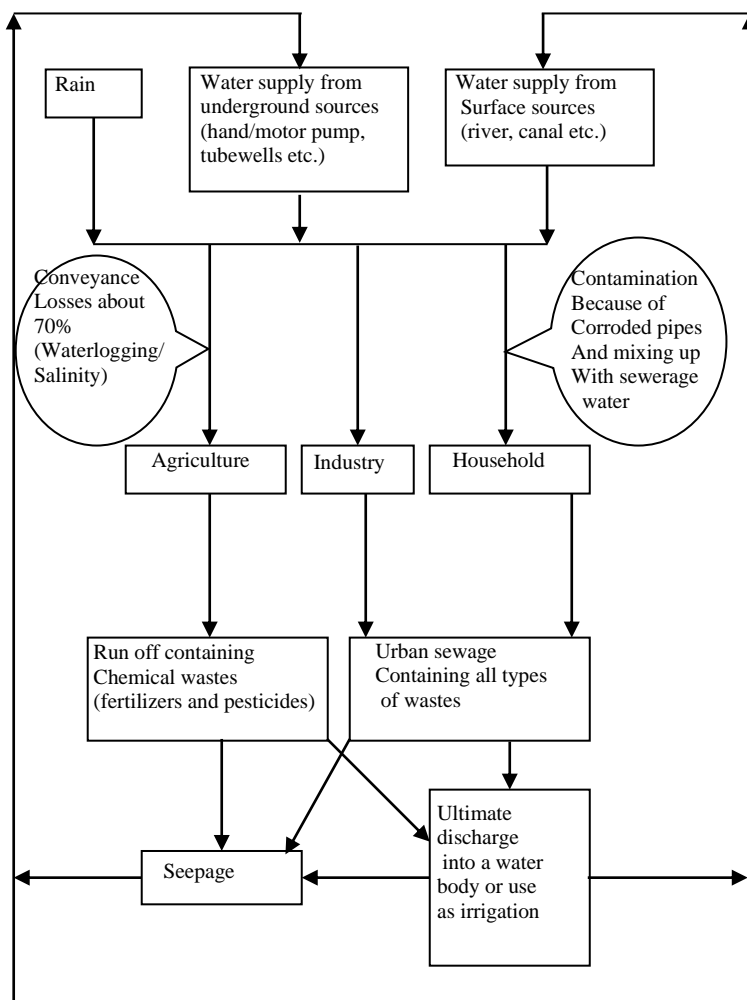
Fifth, the Federal Bureau of Statistics should be provided with a grant to conduct a periodic census of environmental organizations.

Given the importance of this issue, and the comparative advantage of the World Bank in data organization and analysis, it would be extremely useful to consider this as a high priority issue. If so, it is proposed, first, that the issue be approached from the “demand” side.

Second, the capacity building resources should be allocated to the Federal and provincial Bureaus of Statistics, for the collection of this information on a regular basis. It might also be considered whether a statistical labs could be set up in other organizations to develop models for effective data collection.

Third, the exercise itself as well as the capacity building effort should be in the public domain. In other words, the cost studies should be presented annually in a national conference on the quality of life. Similarly, the data collection agencies should be responsible to a steering committee composed of government, business, and NGO members, with interest in environmental information.

Figure 3.1:



Chapter 4

Action Impact Matrix (AIM) Approach: A Tool for Analysis

As the links between development and the environment are beginning to be understood better, the analytical tools and methods to assess such impacts within the conventional economic decision making framework are also being developed. Environmental impact analysis parallels conventional economic decision making at various levels, namely; international (global environmental economic analysis); national/macroeconomic (environmental economic analysis and environmental accounting); regional/sector (integrated resource management) and sub-sectoral/project (environmental impact evaluation).

The internalization of environmental impacts in decision-making has both policy and institutional implications. Two categories of policy interventions have been identified: institutional, and market based. Institutional interventions refer to social policies aimed at poverty alleviation. They tend to mitigate adverse environmental impacts indirectly. Environment specific policy initiatives require strong institutional support. Key to this are environmental protection laws, regulatory measures and administrative reform with a focus on innovation and equity. Thus, EPAs with enforcement mandates tend to be hamstrung by technical and financial constraints and need to switch to voluntary arrangements for compliance. Similarly, legal and regulatory measures should be extended to include community property rights and participatory management principles. A consultative process is key to instituting social and management innovations aimed at empowering stakeholders, especially in the face of political and administrative resistance. Such consultations ensure ownership of the process, devolution of financial responsibility and

mutual accommodation. In their absence, even pro-poor measures can easily get subverted. This is strikingly evident in the sanction of property rights. While secure property rights are, in principle, a means of addressing sustainable development the reality in many cases involves expropriation of the poor. Thus not only are such rights questionable on the grounds of equity, they can lead to conflict, non-cooperation and theft and thus produce adverse results.

The second category is that of market-led initiatives, which includes the correction of market distortions as well as the introduction of measures that work through the market. The first type, which corrects for market distortions, favors the use of market instruments for environmental improvement. A major plank of this is the elimination of perverse incentives caused by government pricing, tax and expenditure policies, perverse subsidies and other forms of market intervention. It has led, for instance, to calls for increases in prices of water and energy (electricity rates, natural gas prices, and prices of POL products), removal of subsidies on pesticides and fertilizers, correct valuation of resource based products (e.g. timber). Most policy reforms championed by multilateral financial institutions fall in this category.

The second type can be best described as 'using the market'. This approach advocates the use of market-based instruments (MBIs) for sustainability. This includes levying pollution taxes or pollution charges. While these are quite consistent with the approach favored by financial institutions, they have rarely been recommended, nor has there been adequate work on establishing conditions under which such incentives would produce the desired results.²⁰ The problematic is illustrated below in a simple and stylized manner in Box 2.

20 During the NEQs process the Ministry of Environment , PEPA, SDPI, FPCCI, OICCI and other NGOs and business organizations jointly undertook considerable work, leading to the landmark approval by the General Body of the FPCCI of the recommendation to levy a pollution charge on industry – perhaps the first of its kind anywhere in the developing world. Notwithstanding its significance and utility, the initiative has foundered on the dismissive attitude that the finance and revenue organizations have adopted towards it. The multilateral finance organizations need to be more forthcoming in supporting this initiative.

Macroeconomic stabilization and investment policies, which promote growth, are synonymous with various forms of pollution and degradation. Examples are increased air and water pollution and deforestation. To curb the adverse environmental impacts of growth, additional pricing measures are required (such as stumpage fees in the case of deforestation) or price rationalization where they do (such as price subsidies on energy and water use). Additionally, new charges need to be imposed to account for external costs (reflecting market failure) such as biodiversity loss and the downstream effects of watershed degradation associated with deforestation, as well as to encapsulate the adverse health effects of water and air pollution.

Environmental considerations also make it necessary to adjust the timing and sequencing of macroeconomic and sector policy reforms. Consider a typical case where a country is facing both a high budget deficit and current account deficit. Trade liberalization which precedes internal adjustment measures, such as removing subsidies, can aggravate environmental pollution, thanks to increased foreign investment in sectors where such subsidies exist, such as in energy. Also, stabilization measures meant to restore macrostability can have short-term contractionary aspects, which may be environmentally destabilizing. Thus, fiscal austerity in the shape of cutbacks in social sector programs can worsen poverty and increase pressure on the environment. Or, there may be direct cutbacks in allocations for environmental programs. The changing cost calculus implicit in environmental impacts suggests care in instituting such cuts.

Integrated environmental impact assessment can be carried out with the help of rigorous econometric analysis or modeling. However, the data requirements are extensive. Alternatively, simple organizing frameworks can be employed for more qualitative assessments but at the cost of sacrificing rigor.

4.1 Econometric Models

An integrated assessment of the impacts of economic policy reform on the environment has been attempted in Pakistan's case by Akhtar (Akhtar, S: 1994) who used dynamic

and comparative static models to simulate environmental impacts both multi-sectorally and for a single sector (agriculture).

Akhtar relied almost exclusively on the idea of a deterministic relationship between economic growth and pollution as embodied in the Environmental Kuznets Curve approach. His macroeconomic model simulates the impact of economic reforms on the environment in a two-stage process. First it links reforms represented by an increase in the savings rate with economic growth -- with and without population stabilization. In the second stage, it relates projected trends in economic output and population to environmental impacts through the application of functional relationships drawn from previous cross-country studies, a la the Environmental Kuznets Curve. Accordingly, it projects when Pakistan would turn the corner with respect to access to safe water, urban sanitation, and ambient concentrations of particulates, sulfur dioxide and nitrogen oxide and fecal coliform count in rivers.

There are some limitations to this approach. First, it does not model loops and feedbacks showing the reverse impacts of degradation on growth -- thereby overstating the impacts of economic reforms. Second, it excludes consideration of policy/institutional/technical development for mitigating environmental degradation. Third, the aggregative nature of the exercise does not allow one to trace the environmental effects of specific macroeconomic policies, with the effects being traced through savings rather than directly. On the other hand, population control simulations produce intuitively plausible results -- primarily through urbanization effects -- and shown as improved access to clean water and sanitation, reduced waste as well as emissions. Population stabilization also improves the growth stimulus provided by economic reforms.

While the dynamic approach is aggregative, and lumps all economic reforms into an increase in the savings rate, the CGE model goes into more detail. However, the comparative static analysis is premised upon fixed stocks of labor and capital. The model predicts how these factors are allocated among

competitive uses in response to policy shocks and what are the environmental impacts of these reallocations.

The agriculture sector model is the most comprehensive exercise in its evaluation of environmental impacts. Price and infrastructural incentives are simulated on the World Bank Indus Basin Revised Model (IBMR)

4.2 The Action Impact Matrix

Although less rigorous than a formal modeling exercise the action impact matrix (AIM) is a useful organizing framework for articulating policy-environment linkages. The AIM makes it possible to ‘promote an integrated view meshing economic decisions with high-priority environmental and social impacts’ (Munasinghe: 1996). The focus is on broad relationships rather than quantifiable impacts, as in modeling exercises, although the relative intensity of impacts can be qualitatively assessed. Following from there, the AIM provides a range of economic, social and institutional options for enhancing positive environmental impacts and mitigating negative ones. It is also a useful framework for prioritizing and sequencing economic policy reforms. A simple template for an AIM is presented in Box 4.1. A more detailed AIM for Pakistan is developed in Box 4.3 onward. Essentially, it synthesizes some of the sector analysis in Part III.

As can be seen in the matrix, the first column includes the entire range of conceivable policy and institutional options. The second column focuses exclusively on the economic impacts of such policies and measures at both macro and sector level. The remaining columns assess their impacts on environmental sustainability (illustratively represented by air and water pollution, land degradation and solid waste generation). Viewed laterally, positive economic benefits can accrue concurrently with adverse environmental impacts, as in the case of exchange rate reform. The vertical coordinate presents offsets to such adverse impacts in the shape of sectoral and complementary policies. Thus increased air and water pollution, reflecting the growth enhancing effects of exchange rate reform, can be counterbalanced by

improved energy pricing, pollution charges and improved monitoring and enforcement of environmental regulations.²¹

As indicated, the AIM is a useful organizing framework which makes it possible to track impacts intrasectorally as well as across sectors with a view to devising policies and measures that are both growth enhancing as well as environmentally sustainable. In the next section, we apply this integrating criteria to the economic reform process in Pakistan.

4.3 The Reform Process and its Environmental Implications

In the early 80s and through the 90s, Pakistan negotiated a series of agreements with the World Bank and the International Monetary Fund. These extensive agreements encompass stabilization, structural adjustment and sectoral reforms. Initially, its elements were commendable and complementary in nature, and were not directly linked to conditionalities. Over time, however, the agenda became both more comprehensive and more intrusive, with time bound over-lapping cross-conditionality. A common feature of these programs is their almost exclusive economic orientation. While they evolved over time to embrace the equity dimension, environmental sustainability concerns were not substantively addressed. This is not to say that they were completely ignored, but the measures included in successive programs are piecemeal and additive, as opposed to being an integral and protected part of the core socioeconomic agenda.

The summary (Box 4.2) shows the key elements of the reforms that have potential environmental impacts and are extracted from the following agreements:

- 1980-83: IMF, Extended Fund Facility, World Bank, Structural Adjustment Loan
- 1988-91: World Bank, Structural Adjustment Program
- 1993-96: IMF, Extended Fund Facility
- 1998-01: World Bank, Structural Adjustment Loan
- 1998-01: IMF, Enhanced Structural Adjustment Facility

21 Note that the environmental benefits are implicit in the complementary measures indicated

The overall objective of the reforms appears to be the creation of conditions in which markets would work more efficiently. This objective was sought to be achieved by limiting the size of the public sector through budgetary reform, introducing market-based pricing and incentives wherever possible (by eliminating subsidies, introducing market based instruments, and de-regulating prices), switching from public to private ownership of assets and investment (privatization, de-regulation, and establishment of private property rights in water and common resources) and initiating institutional reforms needed to make this transition possible.

This is not to say that the economic reforms have no environmental benefits associated with them. Thus, price rationalization is expected to lead to resource conservation and emission reductions across sectors by primarily influencing demand. Privatization, investment and institutional strengthening would engender similar supply responses. Macroeconomic reforms designed to achieve internal balance (taxation, expenditure) and external stability (exchange rate, trade) would create a favorable climate for growth by lowering inflationary expectations, enhancing efficiency and improving export competitiveness. In addition to the identified environmental benefits, reduced inflationary expectations would tend to relieve pressure on natural resources.

However, such expected environmental benefits are, essentially, spin offs from the core economic agenda rather than optimal outcomes that would ensue had environmental concerns been mainstreamed into this agenda. This is evident from the fact that there has been no effort to sequence the economic reforms keeping environmental impacts in mind. Also, low environmental priorities are reflected in the absence of explicit protection of environmental programs from budgetary cuts. But, perhaps, the most critical disjuncture is between economic policies and complementary measures. Policies aimed at addressing market failure are very much in the incipient stage while the institutional innovations that would make their application effective are also lacking.

While the ongoing pollution and degradation is rooted in the inability to adopt a systemic approach towards sustainable development, at a more generic level the macroeconomic and structural reform agenda is thwarted by political vacillation and weak governance. This creates recurring problems of policy reform reversals and implementation failures across the board. While it is encouraging to note that multilateral agencies are becoming increasingly cognizant of governance concerns, their focus tends to be selective, rather than cross-cutting. The IMF's Policy Framework Paper for the EFF (1998-2001) explicitly targets fiscal and financial accountability. There is a need to replicate this in the environmental area as well, where the various legislative and institutional initiatives are increasingly nullified by political, financial and implementation exigencies.

4.4 Environmental Elements in the Reform Process

With increasing recognition of the need to address environmental degradation environmental initiatives were added to the reform agenda. However, in most cases, efforts to link them explicitly with economic reforms, or frame them within a wider sustainable development context are noticeably absent. As mentioned earlier, such integration was neither conceived nor attempted. For instance, in 1988, the Bank noted that the reform program "should be supplemented with an active population policy and natural resource/environmental management strategy." The 1993-'96, ESAF/EFF, Policy Framework Paper, takes the environment to a higher level of prominence but again, essentially, as a stand-alone theme.

Box 4.3 shows the progression from no mention of the environment to generalized statements of intent, to specific environmental initiatives. Also, the focus is on institutional rather than sectoral initiatives. While this is appropriate, reflecting the need for an overarching legal and regulatory framework, there are obvious limitations in merely formulating laws, regulations and procedures. Effective implementation requires: a) that such laws be instituted through consultative

processes which are also expanded to include community concerns; b) implementation mechanisms which involve the participation of key stakeholders and; c) assured technical and financial support for bodies entrusted with environmental conservation responsibilities, such as the EPAs.

4.5 An Action Impact Matrix (AIM) for Pakistan

The Action Impact Matrix for Pakistan is developed through a sequence of three inter-related tables, Box 4.4 onwards. The first presentation, in Box 4.4 provides a description of the indicators and causes of selected environmental problems in Pakistan. This is followed, in Box 4.5 by the current economic conditions and proposed reforms. Finally, the sequence of descriptions in Box 4.6 use the previous information to construct an Action Impact Matrix.

Action Impact Matrix (AIM) Approach: A Tool for Analysis

Action Impact Matrix (AIM) Approach: A Tool for Analysis

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Part III

The State of the Environment

Chapter 5

Forestry

In the chapters that follow, we review the conditions in key natural resources—forests, water, soils—and air and water pollution, and link them to the major socio-economic sources of pressure on the environment—agriculture, industry, trade, and population growth. This chapter looks at the forestry sector; it is followed by chapters on other resource and activity sectors. As mentioned earlier, fairly reliable information is available on the natural resource base of the country. However, information on brown and gray areas is somewhat more limited.

5.1 Introduction

Forests serve many purposes, commercial, subsistence, ecological, and social. Commercially, forests are a source of wood for timber and fuel wood; they also provide esthetic pleasure, encourage tourism, and constitute a potential source of agricultural produce, via conversion to cropland. In addition, they meet the subsistence needs of communities in the form of fuel wood, timber, fodder, medicinal herbs, and edible plants. The ecological services of forests include prevention of landslides—which benefits not only local populations, but also the national economy by reducing siltation of dams and moderating the downstream impact of floods—providing a habitat for a broad range of flora and fauna, and sequestering carbon. As is the case for most of the natural resources, there is a close relationship between the conservation of forests and the eradication of poverty. The area under forests in Pakistan has traditionally been occupied by poor and marginal populations, often in inaccessible mountainous areas, and increasingly under threat because of the

gradual encroachments upon their rights as well as systems of governance.

Globally, forests cover some 3,500 million hectares, roughly a quarter of the land surface of 12,500 million hectares. In contrast, forests cover less than 5 per cent of Pakistan's land area (Table 5.1), and most estimates suggest that even this modest cover is receding quite rapidly. This is in spite of the fact that organized forest management has a history of almost 150 years in this region. The current situation is the result of a combination of factors, including institutional collapse, demographic pressure, rising conflict, and incentive incompatibility.²²

Table 5.1
Area under forests, rangelands

('000 hectares)

Type of forest	1988-89	1994-95
Coniferous	1,261	1,911
Irrigated plantation	218	226
Riverine	300	456
Scrub	569	1,287
Coastal	345	345
Mazri lands	24	24
Linear plantation	159	6
Rangelands	4,149	6,409
Total	7,025	10,664
Private plantation		159
<i>Memo item: Annual deforestation. % (1985)</i>	7	3

Source: Government of Pakistan. 1998. *Agricultural Statistics of Pakistan 1996-97*

In Pakistan, forests are one of the "traditional" environmental sectors, meaning that the history of actions to protect and conserve forests long predates the advent of conscious environmentalism in the country. Given this history and the confidence it generates, forests are popular both among policy makers and the general public, and forestry programs have figured

22 The term incentive compatibility refers to a situation where "the incentive faced by an individual [organization] is such that s/he automatically and voluntarily does what society wishes him/her to do" (Enayatullah: 1: 1993).

prominently in most environmental initiatives, including the NCS and EPRCP. Despite this, however, it is difficult to argue that the previous 8 years have produced an increase or improvement in the forest area, or even a measurable slowdown in the rate of deforestation.

This is a costly trend. The Brandon (1995) report estimated that the cost of deforestation in Pakistan is between US\$ 28-36 million per year, which is two to three times higher than the revenue proceeds from forests. The cost of remediation for forests as estimated by Rogers (1997) is about US\$ 157.40 million.

5.2 Forestry Data

At the outset, it should be stated that published information on forests and rangelands is deceptive. While the *Compendium* reports a 27 per cent increase in the forest area between 1980-81 and 1996-97 due to the government's tree plantation drive (p. 12), this assertion is belied by other information, including some in the same publication. The Human Development Report 1998 cites an annual rate of deforestation between 2.9 and 3.1 per cent. The Biodiversity Action Plan also questions the official numbers. It states that woody biomass is declining at about 4 to 6 per cent per annum—the second highest rate of decline in the world—and that under present trends, Pakistan's woody biomass would disappear completely in the next 10 to 15 years (BAP 1998: 11). Pakistan is one of the developing countries with no remaining biologically undisturbed forests (WRI: 1997), and good quality tall tree forests (with more than 50 per cent density) occupy no more than 40,000 hectares (BAP 1998).

The above skepticism is supported by the conclusions of the HESS study, the only authentic inventory of forestry data. Data collected through satellite imagery shows that only 308,000 hectares are under dense forest cover. (FSMP: 1992). The study also shows that the total consumption of wood products is 55.57 million m³ per year—of which fuel wood consumption is 51.29 million m³, or 93.4 per cent of the total—compared with the estimated sustainable supply of only 6.51 million m³. As such, forests are not a sustainable source of fuel wood supply, unless the

gap of 46.06 million m³ can be met from imports (Ahmed and Mehmood 1996).

One reason for the discrepancy between different data sources is technical. The increase in numbers only indicates that the area under the control of Forest Departments has increased; it does not necessarily reflect a change in the quality or density of the forests, their potential for sustainable yield vis-à-vis actual extraction, and the rate of deforestation (UNCED National Report). However, another reason is a conflict of interest in data collection. Official forestry statistics are based on the data collected by forest departments, for whom forest area is a measure of performance. This provides incentives for over-stating the forest cover and understating the extent of deforestation. While satellite and aerial surveys can be used to verify official statistics, their use has been restricted because of security considerations.

Even if the official account of an expanding forest area were accepted, the situation is far from optimal. In the first place, the purported increase is on the extremely low base of less than 5 per cent. Second, it conceals the fact that while the deforestation pertains to the loss of primary forests, reforestation consists largely of low-diversity, commercial forestry. In other words, the divergent trend in forest types corresponds to losses in genetic diversity and resilience.

5.3 Pressure: Causes of deforestation

Be that as it may, the underlying forces of deforestation are population and economic growth, poverty, and urbanization and expansion of agricultural lands. In Pakistan, the generalized deterioration of institutions and governance, exacerbation of social conflict, and the influx of refugees have compounded the impact of these forces.²³ The forest management system, designed for a

23 A different and more complex dialectic prevails in the Northern Areas, where the Karakorum Highway (KKH) has created an economic boom and provided an outlet for the growing population. While this has reduced the pressure on the environment, the net result is that the 'degradation of their surroundings is less of a concern to the villagers because its importance is not as preponderant as it used to be' (EDC: 1992: 33).

different set of conditions, has been unable to cope with these changes.

Poverty, especially the fuel wood needs of the poor are believed to constitute a major source of pressure on forests. One component of the problem is the weakness of community institutions in the face of rising pressures. Community management traditions, already fragile, have eroded further with new opportunities for employment and out-migration. Also, demographic and development pressures have forced communities out of their traditional lands into marginal areas where competition for resources is severe, resulting in further violations of indigenous property rights. The situation is increasingly marked by conflict, with communities forced to act as predators rather than as guardians of the commons.

The Pakistan Forest Institute estimates that fuelwood constitutes 87 per cent of the demand for forestry products (*Compendium*, Table A-55). It is difficult to assess the validity of the precise numbers. However, that is not the point, since there is little disagreement over the fact that fuelwood demand is a significant source of pressure on the forest resources. This demand is not exclusively a subsistence demand, since roughly half the population buys fuelwood from the market. Furthermore, it is not confined to the poor, since roughly 80 per cent of all households (and 90 per cent of rural households) use firewood (*ibid*: Tables A-56, A-57). Nevertheless, it has been associated with poverty in many analyses, and has been contrasted with timber demand, which is more prevalent among upper income groups.

There is little doubt that the demand by the poor of firewood, and indeed other forestry products, has made inroads into forest resources. However, it is equally clear that organized and commercial timber extraction poses an equal if not graver threat, especially by depriving the local inhabitants of any rationale to protect the resource. The involved groups are large forest owners-cum politicians, timber contractors and influential community representatives. Their actions are in direct proportion to monetary incentives, represented by rising prices of timber products. Such groups tend to collude with the forest department staff for mutual

gain and profit. Other factors contributing to the decline in professional integrity and competence are the politicization of appointments, inadequate training and lack of offsetting non-monetary incentives.

5.4 The Forest Management System

The legal and administrative precedents for forest management date back to the colonial period. While systematic records are not available, travelers' reports from the 18th and 19th centuries report extensive forests in the area that now constitutes Pakistan. The initial impetus for bringing them under state control came from the need for timber for railway sleepers in the mid-nineteenth century. The system of forest management established at that time continues to be operational, with slight adjustments until today.

Under the current system of management, the bulk of the forests are owned collectively by the local villagers, but managed by the provincial forest departments, or, in some cases, by other public or quasi-public agencies. The rights of the "owners" vary from place to place. In principle, they receive a share (ranging between 20 and 80 per cent depending on the area) of the sale of timber from the forest, and have certain rights of usage of forest products and services—including grazing, drift wood collection, and other personal or communal use.

An important point to note is the incestuous nature of the forest management personnel in Pakistan. Although the Federal Government has a position of the Inspector General of Forests (IGF), forest management is essentially a provincial subject. The authority of the IGF comes from his seniority in a very unified bureaucracy, rather than his legal or constitutional powers.

The main organizing unit of forest management is the forest division, which is headed by the Divisional Forest Officer (DFO), the key executive level in the forest bureaucracy. The DFO reports to the Conservator of Forests, who is under the authority of the provincial secretary of the Forest Department, who reports to the Minister of Forests. The forest bureaucracy is recruited almost exclusively from forestry experts, trained in specialized

institutions. These experts also form the bulk of the staff members of other forest-related institutions, including Forest Development Corporation, Forest Training Institute, Social Forestry Programs, and specialized forestry programs in NGOs (e.g. AKRSP, IUCN, NRSP, and others). Except for brief periods, the entire professional staff, right up to the secretary of the department, has come from the same educational background. Indeed, even Ministers of Forests have tended to come from the small pool of forest contractors.

The DFO is responsible for surveying the forests in the division, preparing working plans for optimal growth, and overseeing the sale of mature trees. The sale is based on the physical demarcation of the trees to be cut, which are auctioned to the highest bidder. After deduction of management expenses by the government, the balance of the proceeds of the auction are distributed between the state and other right-holders in the forest.

While exact figures are not available, forests at one time constituted the largest single item of revenue in several regions. Today, although provincial forest departments (mainly in the Punjab and NWFP) continue to earn Rupees 600 to 700 million in revenues each year (*Compendium*: Table B-13), these constitute less than 0.4 per cent of the gross receipts of provincial governments. Be that as it may, the historic reliance on forests as a source of revenue created a bureaucratic incentive system geared towards toward revenue maximization rather than forest conservation.

In practice, there were other problems as well. Commercial logging interests, popularly referred to as forest “contractors” (and often as the “timber mafia”) collude with accommodating bureaucrats, both to cut unmarked trees illegally, and to maximize private earnings and consequently deprive both the villagers and the state of their due share from the proceeds (see Box 5.1). The advent of democracy has, ironically, led to an expansion of such practices, mainly because of the enhanced political power of the logging interests and the extension of their control over the forest bureaucracy. In addition, the rules and regulations tend to be inflexible and lack transparency; for instance, fines and penalties have not kept pace with rising prices of timber and are applied

selectively, making violations less onerous. Also, permits tend to be distributed in a discretionary manner.

Box 5.1
Forest Royalties in NWFP

Forest Royalties in the North West Frontier Province
(Knudsen: 1995)

Forest royalties are at the very core of the problem of perverse incentives. With the enormous financial stakes involved, most of the revenues tend to get skimmed off before reaching the communities. The system is not only inequitable but is designed to promote deforestation rather than conservation.

In both protected and guzara forests, where communities have legal rights to forest resources, the net revenues (after deducting costs) from timber sales are split between communities (royalties) and the government. The distribution is as follows:

- Prior to 1981, the fixed price system was adopted, where the concessionaires were paid a fixed amount per cu. ft. of the harvested volume. The problem was that returns did not keep pace with the rising price of timber.
- Subsequently, the net-sale system was introduced. Under this system, the harvested timber is auctioned at timber markets. The net proceeds are then divided between communities and the government, with the community share ranging from 60% – 80%. Ideally, this allows communities to get the benefits of rising prices

In effect, the system is iniquitous and is manipulated for profit by the timber contractors, who in their capacity as large forest owners, elected members and community representatives wield considerable political clout. The forest department colludes actively in the manipulation of the system. Some common malpractices are:

- After being awarded a logging tender the contractor deliberately delays logging in the specified block (coupe) in anticipation of rising prices because he has the financial means to engage the forest department in extended lawsuits.
- Using the clout of local notables, timber contractors obtain powers of attorney for the village concessionaires for the collection of royalties from the government. These royalties are retained after payment of a pre-agreed amount to the local notables and forest department staff.

- Under the net-sale system, timber contractors buy up royalties from local communities for a fixed price slightly above the old fixed rates (Rs.50 per cu.ft.) -- communities are willing to forego higher but delayed payments for quicker upfront disbursements. Subsequently, the contractor bids for the contract under an assumed name. He also has an incentive to log more than the agreed volume (facilitated by bribing forestry department staff), as this means more royalties for him.

While, admittedly, these malpractices are possible due to loopholes in forest legislation, the politically powerful contractor networks not only enjoy immunity from the law, they also resist attempts at legal reform which would close such loopholes (see below).

Also, in addition to benefiting the contractors at the expense of poor communities, the system is clearly geared for maximum destruction. An alternative system (Inayatullah: 1996), “involves a change in the formula of payment from royalties to income; in other words, owners receive an annual payment based on the number of trees standing in their area, not on the number of trees sold.” Implementation of such a system pre-supposes extensive documentation and information about existing stands. More generically, it is premised upon the requisite political will.

5.5 History of Forest Management

This may be a useful point to recount the history of forest management. According to Guha (1989), “the landmark in the history of Indian forestry is undoubtedly the building of the railway network. The large-scale destruction of accessible forests in the early years of railway expansion led to the hasty creation of a forest department, set up with help of German experts in 1864” (Guha 1989: 37). Guha goes on to remark that the assertion of the monopoly right of the colonial state was considered essential to protect against deforestation.

“A prolonged debate within the colonial bureaucracy on whether to treat the customary use of the forests as based on ‘right’ or ‘privilege’ was settled by the selective use of

precedent and the principle that 'the right of conquest is the strongest of all rights—it is a right against which there is no appeal'” (ibid: 38).

As a result, the successive forestry laws, in 1865 and 1878 created the basis for the acquisition of monopoly rights by the state, and an elaborate procedure of forest settlement, which created the discretion for recognizing different classes of user rights. These ranged from “open” or “village” forests, which were to be owned by the villagers themselves; “protected” forests, in which the peasantry was allowed certain “concessions” notified by the state; and “reserved” or “closed” forest, divested of the existing rights of users. The particular allocation of a specific tract was essentially a matter of political negotiation and compromise, rather than recognition of pre-existing rights. The resistance of communities against expropriation led to modifications in concessions through successive legislation. For example, the amended Hazara Forest Regulation Act 1873 created a new category, the *guzara* (or community) forest (Azhar: 1993), ostensibly to return certain tracts of forest, grazing and waste land back to the communities. However, the management of such lands continued to reside with forest departments, which, furthermore, extracted seigniorage for proceeds generated through sales of forest products.²⁴ Besides the legal innovations, the colonial state also established an elaborate bureaucracy to manage both reserved and protected forests. This system of management, based supposedly on scientific considerations of sustained yield forestry, continues today.

Three elements of this arrangement are particularly noticeable. First, under state management, the revenue orientation of forestry institutions became increasingly marked. Second, the proper operation of this system depended on an honest and competent bureaucracy, and especially its independence from

24 A hybrid category, the ‘protected’ forest also emerged. Communities were allowed open access to resources in these forests, except for specific uses proscribed by the government. This was essentially intended to arrest the growing trend towards encroachments.

commercial logging interests. As the quality of the bureaucracy deteriorated because of the decline in income levels, loss of training opportunities, increased influence of the commercial interests over the political system and the consequent erosion of systems of supervision, their ability to protect the resource under their stewardship has declined. Third, given that the income of the peasantry depends on the proceeds from the auction of forest resources—and especially in view of the inability to protect their property rights—their incentive is also to maximize short-run earnings from the resource rather than to seek to preserve it in perpetuity.²⁵ A combination of powerlessness, poverty, new economic opportunities and the increased commercial value of natural resources (timber, fuel wood, medicinal plants, and edibles) have undermined the stakes of the putative owners in the forestry resources.

In response to these adverse outcomes, a number of alternative arrangements have been introduced in recent years (Box 5.2). These include management by a state-owned corporation, the Forest Development Corporation (FDC), the creation of forestry cooperatives, and social forestry programs led mainly by NGOs with financial support from bilateral donors. Finally, a number of programs of advocacy, rights protection, and social education on forestry issues have also been instituted by independent NGOs.

25 Weak property rights increase fears of expropriation by powerful groups, fuel insecurity about future earning streams, especially in an inflationary environment and, in general, give rise to concern about the free rider problem, namely, that forests will disappear no matter what the community might do (Inayatullah: 1996). Even in privately owned forests (guzaras) “right holders may see in regeneration a reintroduction of state property rights, which may stifle even natural regeneration.” (Azhar: 1993).

Given the long history of forest management, it is not surprising that a number of innovative programs were introduced from time to time. These included both government- and NGO-led initiatives. Box 5.3 provides a list of the most well known of such programs. Notwithstanding the different institutional ownership, all these programs shared a common focus on community participation and empowerment as a means of facilitating direct involvement of local communities in forest management. A central element of such programs is their close links to the goal of poverty eradication. As such, they are strongly derivative of the successful experience with community development programs in Pakistan (and the rest of South Asia) over the last three decades. While the programs have been highly successful in regenerating the forest as well as enhancing the income of the poorest populations, they cover a very small proportion of the total forest area.

**Box 5.3
Community Forestry Programs**

Project	Forest Tenure	Equity	Stability	Sustainability	Productivity
MSFP	Private	Medium	Medium	Low Medium	Very High
KIDP	Protected	High	High	Low	High
SFDP	Reserved	Very High	Very High	Low	High
AKRSP	Communal	Very High	Very High	Medium	Very High
WPMP	Communal	High	High	Low	High
SWMP	Shamlat	High	Very High	Low	High
SFSDP	Protected	Medium	Medium	Low	High
FP & DP	Private	Medium	Medium	Low	Very High

Source: Mehmood and Ahmed: 82
 MSFD Malakand Social Forestry Project
 KIDP Kalam Integrated Development Project
 SFDP Siran Forest Development Project
 AKRSP Aga Khan Rural Support Programme
 WPMP Watershed Planning and Management Project
 SWMP Saketar Watershed Management Project
 SFSDP Sind Forestry Sector Development Project
 FP & DP Forestry Planning and Development Project

Other variations on forest management include direct management by the FDC, which is staffed mainly by veterans of the provincial forest departments, but whose advantage over the

traditional bureaucracy lies mainly in terms of better conditions of service for its employees. Finally, the Government of NWFP instituted a scheme of forest cooperatives, ostensibly to provide villagers with greater direct control over the disposal of the assets. In practice, however, these cooperatives are said to have been captured by commercial and political interests, and have led to a further marginalization and effective expropriation of the poor shareholders, and a massive degradation of forest resources.

5.6 Response: Legal and Institutional Reform

The ultimate drivers of forest degradation are economic and demographic growth, poverty, and conflict. It is clear that these must be addressed as part of an integrated solution for this problem. Nevertheless, these are long-range and cross-polity problems, which also require long-range solutions. In the interim, there is a need to focus on the proximate drivers and to provide near-term solutions. There is a general agreement that the main proximate problem is that the orientation of the forest management system is no longer towards conservation, even if it once was so. The competence and integrity of the forest bureaucracy have been tested severely by the deterioration of governance. The weakness of property rights as well as collective institutions has deprived the putative owners of the forests of any stake in their preservation. Champions of alternative approaches and programs have neither the reach nor the political strength or across-the-board legitimacy to advance their agenda on a broad front. Ironically, the advent of such programs has tended to draw the best and most committed foresters out of the government bureaucracy, and thus deprive it even further of any commitment to conservation.

Of the multitude of interest groups—presumptive owners, forest professionals (i.e., forest bureaucracy, FDC staff members, and other experts), the loggers (i.e. the so-called timber mafia), NGOs, and foreign donors—only the latter two have an explicit commitment to conservation. These are also the newest players in this area. The pre-existing groups have a long history of involvement in policy debates, and their perceptions of

possibilities are colored heavily by their stakes and experience in the prevailing system. As such, most of the stakeholders, and especially the most powerful amongst them, have an incentive to pursue goals at variance with conservation. The goal of both the villagers and the state has by and large been limited to the maximization of auction proceeds, while that of many (though not all) officials and forest contractors is the maximization of their personal fortunes. A major reason for this is the gradual deterioration in the quality and integrity of forest officials, as well as the effectiveness of the system of supervision and monitoring.

As such, the restoration of the forests must begin with the restoration of the ethic of conservation amongst the key stakeholders. According to UNEP's flagship publication, *Global Environmental Outlook 2000*, the "achievement of sustainable forest management on a global level necessitates the involvement of a range of interest groups and accommodation of multiple interests in forestry planning" (UNEP 1999: 39).

This situation is not unrecognized in official circles. Indeed, there have been a number of attempts to introduce institutional and policy reforms to help overcome these problems. The centerpiece of most reform efforts is to elicit the participation and cooperation of the ultimate landholders. However, institutional reform is difficult because those who are in a position to initiate it have a vested interest in resisting it.

This is illustrated best by reference to the reform efforts currently under way in the NWFP, which has led the way in debating various options—in keeping perhaps with its status of as the most forested province in the country. The current reform proposals revolve around the draft NWFP Forestry Act of 1998. To shepherd the reform process and in particular the processing of the draft Act, the provincial government has established a Steering Committee of forest department officials, constituted forestry roundtables, initiated the formation of a Forestry Commission with advisory powers, and is reviewing the feasibility of departmental restructuring as well as the formation of Village Development Committees.

However, notwithstanding the good intentions, the reform process is alleged to have become a non-consultative and

cosmetic exercise to defend the powers of the forestry establishment. For example, although the draft Forestry Act has gone through several revisions, each circulated widely for comments, none of the comments that pertain to the key management practices have been accommodated or even addressed. As a result, it still retains some of the most problematic provisions of existing legislation, including the distinction between different classes of forests; wide discretion with the bureaucracy to grant concessions, introduce joint management, and administer penalties; and limited powers of oversight with forest tribunals.

A major reason is that all the “midwife” institutions—the Forestry Commission, Forestry Roundtables, and the Forestry Steering Committee—are dominated by serving or retired forest officials. Donors have observer status at the Steering Committee, while civil society participation is by invitation only. An initial required change is to allow the leadership of such activities to be moved to independent institutions with a clear and long-standing commitment to conservation.

While the current reform initiatives have elements of the required changes, they need to be framed in the broader context of switching the goal of the policy stakeholder groups toward conservation. The negative environmental externalities caused by deforestation are well known, namely, watershed destruction, dam silting, river sedimentation and flooding. Capturing such effects by imposing a monetary cost on timber extraction (stumpage fees), fuel wood collection, land use changes, and development encroachments is an effective way of rationalizing such activities. However, such internalization of environmental costs is not only technically difficult, it also represents direct inroads into economic profits and, hence, tends to be politically contentious. This is a proper focus for a forestry roundtable process.

The reform process needs to bring about changes in four areas. First, it should seek to ensure that the incentives faced by different stakeholders are in accordance with the broader conservation agenda. Second, the appropriate incentive structure has to be supported by a professional and independent system of monitoring of performance—including the regular use of aerial

and satellite photography. Third, incentives and monitoring institutions need to be subject to popular control, not through elected bodies or cooperatives, but in the form of direct participation by villagers in forestry planning, management, and research. Fourth, the sanction behind the above systems has to be provided by a system of legal and judicial review.

First, the reforms should lead to changes in the incentive structure faced by different stakeholders as described below:

1. **Logging interests:** pricing measures such as pricing negative externalities and linking fines with timber prices;
2. **Forest officials:** improving institutional incentives within the forest bureaucracy—promotions, salaries, social security and health and safety regulations;
3. **Villagers:** re-orienting royalty payments towards tree stands rather than trees cut;
4. **Forest communities:** providing incentives to communities, such as development incentives which are usually provided by the donors/NGOs, such as rural infrastructure and services, energy alternatives, food for work, jobs in different projects and;
5. **Development agencies:** increasing costs of projects implemented at risk to natural resources, e.g. road building, tourism etc.

The current system of monitoring forest cover relies almost exclusively on the information provided by the forest bureaucracy. This creates a serious conflict of interest. This can be overcome by establishing an independent system of monitoring, preferably in the hands of independent non-governmental institutions and the Ministry of Environment, and relying on aerial and satellite data as well as ground information. This data should be made available for research on sustainable forestry management. A fixed fraction of the forestry revenues need to be allocated to monitoring and research activities, both of which need to be independent of the government. Specific responsibilities should include:

1. Sustainable land use planning accompanied with data generation on cover, condition and density of the forests

2. Research on forestry issues especially on incentives for sustainable forest management

The goal of participatory management is relevant for forestry conservation as well as poverty eradication. However, government departments have neither the expertise nor the inclination to institute participatory management. In Pakistan, such actions have historically been led by NGOs, and it is to them that the reform process must turn for guidance and leadership. They also have the expertise and commitment to lead a transparent roundtable process.

Finally, the system of forest management has to be backed by appropriate legal authority for judicial review, arbitration, and prosecution. The first step in this is to establish both criminal and civil liability for infractions of the rights of the forest owners. This would involve providing greater clarity to tenure and usufruct rights.

Chapter 6

Fresh Water

Water, like forests, is also a “traditional” environmental sector, in the sense that there is a long history of water management in the country, dating back to the colonial and pre-colonial periods. The colonial government acted as a classic “hydraulic state”, whose infrastructural investments provided it with both a means of legitimacy and control. The irrigation management bureaucracy established during that period, and its methods of operation continue to be operational, albeit at a larger scale. Unlike the forestry system, however, water management went through a phase of dramatic re-organization and strengthening in the 1950s, when the “development” functions—and by that token, the mantle of professional leadership—was transferred from the irrigation bureaucracy to a new institution, the Water and Power Development Authority (WAPDA). Indeed, the basic framework of the present system of water management was established then, and continues to this day. This framework entails sustained investments in water management (including drainage and reclamation) and a relatively centralized maintenance of reservoirs and the irrigation network.

As such, the institutions of water management are fairly strong, have developed a considerable depth of expertise in selected areas, and attract a very high proportion of public sector investment resources. Although the proportion of development funds allocated to water management has declined monotonically from the high of 24 per cent in the 1950s, they still constitute a significant fraction of the total. More importantly, the country has a fairly homogenous “policy community” around water management, comprising mainly of the professional staff of the two major institutions, most of them graduates of the country’s few engineering universities. They share not only a common

educational and employment experience, but also a common worldview shaped by this education and experience.

However, as in the case of forests, the orientation of the water management institutions and experts is largely toward harnessing the resource in the service of economic growth, and not toward its conservation or proper use. Similarly, there have been persistent perceptions of widespread and systematic corruption in these institutions. As such, although there has been awareness from the very beginning of the ecological as well as economic costs of improper management and overuse of the resource, this awareness has been limited to areas of direct and almost immediate relevance to agricultural productivity. The most well known issue in this regard is that of drainage and land degradation, on which Pakistani experts and institutions have developed a sophisticated awareness and expertise.

Besides drainage, the main environmental issues pertaining to freshwater are scarcity, ecological costs of water management (especially of large reservoir projects), water mining, water quality (for agricultural as well as direct human uses), and equitable access. Indications are that all of these are a matter of concern in Pakistan. Freshwater is a dwindling and inequitably distributed resource. Per capita water availability is declining rapidly, evidence of water mining in some urban areas is accumulating, the quality of both surface and ground water is deteriorating, and access to water is distributed unevenly within as well as between sectors. These issues manifest themselves in different domains, require different types of expertise, have different impacts, fall within the administrative responsibilities of different governmental and non-governmental institutions, and figure in very different policy communities. As mentioned, however, other than drainage, the issues have neither received attention from policy makers, nor the level of social and infrastructural investment warranted by their gravity. Finally, there is no evidence that the advent of environmental consciousness has affected this situation to any degree.

6.1 State of Water Resources

At the time of independence, Pakistan was a water affluent country (above 3,000 m³), but it risks becoming water deficient (below 1,000 m³) in the near future.²⁶ Per capita water availability, estimated at 5,300 cubic meters (m³) in 1951, decreased to 1,600 m³ in 1991, and is projected to have reached 1,200 m³ by 2000. Table 6.1 provides useful benchmark data on water availability in Pakistan.

Table 6.1
Water Availability

Water	Mil acre feet
Canal head withdrawals (1982-87)	102.82
Public tubewells pumpage (1990-91)	5.79
Private tubewells pumpage (1990-91)	38.00
Water requirement at farmgate (1990-91)	114.44
Overall water availability at farm gate (1989-90)	107.14
Losses	
Conveyance network (Mil acre feet)	35
Losses in field (Mil acre feet)	12
Ground water depth (1987) (feet)	11.4

Source: Mohtadullah *et al* (1992).²⁷

The main source of fresh water in Pakistan is the Indus Basin (see Box 6.1). It brings an average of 140 million acre feet (MAF) of water every year to the country, of which all but about 20 MAF are commandeered for human use.²⁸ The vast majority of the

26 These categories are in accordance with international practice (Bhatti *et al*: 1998)

27 Data for this report are derived from Water Resources Management Directorate, WAPDA and Agricultural Statistics of Pakistan. However, the data pertains to different dates, some for the year 1987 and other for 1991.

28 Historic records show that average water flow over 72 years (1922-94) was 138.69 MAF, of which 84 per cent is in *Kharif* and 16 per cent in the *Rabi* season. However, the annual variation around the mean is quite large, ranging from 97.74 MAF in 1974-75, and 186.79 MAF in 1959-60. More importantly, the variation is skewed heavily, and 4 out of 5 years had below average flows averaging 123.59 MAF. The 1990s have been consistently and uncharacteristically wet years.

water diverted for human use, 98 per cent according to government estimates, is allocated to agriculture (WDI: 103). Indeed, water availability at the farm gate has increased steadily from about 64 MAF at independence, and under 100 MAF in the early 1980s, to current levels of over 130 MAF.²⁹ Nevertheless, even this increase has been outpaced by the increase in population, resulting in a net decline in per capita water availability.

Box 6.1

The Indus Basin System

The Indus Basin Drainage and Irrigation System (Faruqee and Ahmad: 69: 1999)

The Context

The scope for increasing cultivation at the extensive margin has been exhausted in Pakistan. Similarly the upper limits of surface and ground water have been reached, as evident in declining water tables in many canal commands (NCS: 1992). The additional provision of 12 MAF in the Indus Water Accord (1992) would have ecologically adverse impacts on coastal resources (mangroves) and would exacerbate waterlogging and salinity as the drainage infrastructure is already overtaxed and would be unable to cope with the additional flows. At the same time, there is considerable scope for cropping intensity increases (8 million hectares according to the NCS, 1992), provided additional water can be made available. An environmentally-friendly option is improved water use efficiency, which can be achieved through a combination of pricing and institutional reform

System Constraints

The irrigation network, originally designed as a run-of-the-river system, has come under pressure with its overlay of additional reservoirs, barrages and canals. Seasonal flow variability, the growing fragmentation of farms and a supply based (*warabandi*) distribution system engenders a permanent mismatch between demand and supply, which is not conducive to water use efficiency. A related problem is the

29 However, not all of the current flow is sustainable over the long run, since the current trend of above average flows cannot be expected to last indefinitely.

lack of natural drainage, compounded by the criss-cross of roads, railways, flood embankments and irrigation systems, which obstruct natural flows. Drainage investments in the shape of deep tubewells and horizontal drainage has only partly addressed the problem as about 4.5 million hectares is still not served by the system. The lack of natural drainage and the contiguous groundwater system requires an integrated approach to the drainage problem and its eventual disposal into the sea. Poor drainage and low canal delivery efficiency (35% - 40%) have given rise to endemic problems of water logging and salinity. About 43% of the canal command area (CCA) is water logged and about 14% of the CCA is moderately-to-severely salt affected. While, seepage contributes to groundwater recharge, considerable wastage also occurs especially where the seepage occurs over saline zones.

Economic and Institutional Inefficiency

The problems of waterlogging and salinity, overexploitation of fresh groundwater, low delivery efficiency, and inequitable distribution stem largely from treating water as a public good. Surface water is distributed free of cost under the '*warabandi*' system while groundwater extraction is subsidized (energy subsidies) and the lack of formally defined water rights hinder its sale to other farmers.

The failure to charge for the full cost of providing water, or at its opportunity cost, is also a sign of institutional weakness. O&M charged by the provincial irrigation departments (PID) is low and has been decreasing over time, while capital cost recovery has been discontinued. This prevents system rehabilitation and improvement. The dissociation of water charges from their rationale also results in revenues becoming a part of the provincial budget rather than being linked to O&M needs. The discrepancy between water rates and the true value of water to farmers encourages collusion with irrigation department officials, discrimination against small farmers, illegal water appropriations and deprivation of farmers at the tail reaches.

The PIDs tend to be locked into rigid a mindset and resist institutional, technical or management innovations and are encumbered by funding constraints. Weaknesses exist in the area of planning (poor investment planning, lack of integration between long-term sectoral plans and short to medium term development plans). Contracting/construction oversight of irrigation and drainage infrastructure is weak and there is little inter-agency coordination.

The focus should be on increasing system efficiency. Benefit-cost ratios of irrigation system rehabilitation range from 2.5 to 6.0 at 12%. However, past efforts at efficiency improvement consisted largely of physical improvements, such as canal rehabilitation, watercourse improvement and land development. Gains achieved through such measures have been offset by system deterioration because of poor public sector performance. So a combination of both pricing and institutional reform is required. Implicit in this is a shift from a centralized supply- based system to a decentralized, market-driven one, underpinned by clearly defined water rights

The Need for Reforms

Institutional Reforms

- In order to make such reforms accessible to the public, it may be useful to start with the same or similar template in all areas of resource management: water, forests, national parks, energy.
- Involve institutions and groups with expertise in community development and social mobilization.
- These institutions can help develop farmer organizations around distributaries/minors
- Policy and reform proposals need to be developed through farmer organizations
- These proposals may include the formalization of water rights; development of autonomous provincial water authorities, and commercially oriented public utilities on a canal command basis
- Establishment of independent statutory bodies responsible for regulating and overseeing provincial public utilities, water rights and groundwater resources

Efficiency Oriented Reforms

- These reforms also need to come out of the participatory process described above. They may include the following:
- Creation of water user rights and legalization of water trading
- Charging a composite rate for surface water that includes a flat rate and a progressive component reflecting its differential value to farmers (richer farmers with larger holdings and with easier access to inputs can achieve higher returns per unit of water consumed)
- Ensuring full O&M recovery which also include future investments for additional and replacement capture, storage and delivery (pricing of service delivery should be based on an acceptable rate of return on fixed assets and working capital)

The proposed institutional structure provides a greater role for the private sector and autonomy for public sector agencies. Federal institutions would continue to be responsible for overall assessment, coordination, and development of inter provincial water resources and works. An administratively autonomous provincial water authority would be responsible for coordinating all planning and development of water resources within the province and would handle distribution of water to financially autonomous independent public utilities at the canal command level. At the production phase a farmer organization would distribute water among its members. A provincial regulatory commission would regulate the O&M charges of the public utilities, and adjudicate farmers' disputes. The process of forming farmer organizations/water user associations has to ensure safeguards against such associations being hi-jacked by large farmers. Resources need to be allocated for research, policy development, and advocacy.

It is occasionally asserted that water scarcity is not a significant issue, since savings could be made on the substantial water losses that occur during conveyance and field application. However, there is a tendency to overstate this.³⁰ A considerable portion represents ground water recharge which, in fact, is being exceeded by withdrawals, as evident in declining water tables in 16 of the 45 canal commands in the Indus River basin (NCS: 1992).

In any event, the dramatic increase in the harnessing of water for developmental purposes has led to the emergence of the two most well known environmental problems in the country: waterlogging and salinity. These problems caught the attention of policy makers in the late 1950s, and became the centerpiece of the work program of the water institutions by the mid-1960s after the release of a series of technical reports (see Mohtadullah 1997: 53). The upshot is that a significant fraction—between 2 and 6 per cent in different plan periods, and averaging about 4 per cent—of the total developmental outlays have been allocated to drainage and reclamation. This corresponds to 51 per cent of the total allocation for the water

30 The view is that of the overall availability of 132 maf at the canal head, close to 70 per cent is lost in transmission from canal head to outlet, from outlet to farm-gate and in the crop zone.

sector during the third plan period (1965-70), between 30 and 40 per cent for much of the period thereafter (ibid), and again over 50 per cent in recent years. These allocations have taken the form of a succession of programs, which have expanded considerably the anthology of developmental acronyms in Pakistan—SCARP, LBOD, OFWM, and others.

Nevertheless, the net result appears to be the maintenance of a particular degree of land degradation rather than its reversal or reclamation. The extent of waterlogging has remained within a narrow range despite a significant volume of investment in reclamation projects. Between 1980 and 1995, roughly 5 million acres had a water table between 0 and 5 feet in June, and 12 million acres in October. The corresponding figures for a water table between 0 and 10 feet were 20,000 and 23,000 acres. Table 6.2 gives details on the type of land in Pakistan, and the extent of land degradation because of waterlogging and salinity.

Table 6.2
Soil Quality and Condition

Area/Indicator	Baseline
Soil Resources Land Classification (n.d.)	Thousand hectares
Class I	5237.1
Class II	6984.0
Class III	4776.1
Class IV	2987.2
Class V	1270.3
Class VI	15410.5
Class VII	15410.5
Class VIII	23197.3
Unclassified	1778.4
Area affected by water erosion (1965-88)	
Slight	398.0
Moderate	3581.4
Severe	3745.9
Very Severe	3446.5
Area affected by wind erosion (1965-88)	
Slight	2595.5
Moderate	496.7
Severe	1668.3
Surface Salinity and Sodicty	
Irrigated	598.7
Un-irrigated	--
Gypsiferous	--
Irrigated	972.1
Unirrigated	713.4
Porous	
Irrigated	1102.9
Unirrigated	732.4
Dense	--
Irrigated	130.1
Unirrigated	1078
Non saline soils	1427.2
Saline soils	127.1
0-5 feet depth (June 1990)	2210
Loamy sands	1357.1
Sandy loam	860.9

Source: Mian and Mirza (1993: 4-10).³¹

31 This information is also available at the provincial level. It was used in the *Pakistan's Soil Resources*, a sectoral paper for the NCS. However, the data are taken from *Soil Survey of Pakistan*, which is undated.

Besides drainage, environmental approaches raised concerns about the quality of water as well. Water pollution has three main sources: bacterial and organic liquids and solids from urban and rural domestic sewage; toxic metals, organic, acids and other less toxic but still polluting substances from industrial discharges; and chemical pollution in the form of pesticide and fertilizer run-off from agricultural lands (Bakhtiar: 1992). The major polluting industries are leather and tanning, electroplating, ghee, fertilizer and plastics, food production and power plants.³² In agriculture, the use of chemical fertilizers has increased from 1 million nutrient tonnes in 1980-81 to 2.6 million tonnes in 1997-98; and that of pesticides from a minuscule amount (probably an underestimate), to 44,872 tonnes. The run-off from these areas feeds into surface as well as ground water.

The NCS reported data on municipal solid and liquid waste, industrial wastewater discharges, and agricultural run-off disposed into water bodies. Since then, however, while additional information has been collected on a range of indicative variables, these do not provide a basis for comparison with the NCS data. The more recent estimates pertain to per capita production of municipal waste in selected urban areas, and on pollution of loads in River Ravi, River Kabul, and a number of watercourses that discharge directly into these rivers. Most of the samples indicate high levels of e.coli (in the dry season) and dissolved and suspended solids, and variable levels of toxic chemicals (especially chromium, nickel, and cadmium). Chemical analysis of hand pump samples in Faisalabad shows that ground water at a distance of less than 25 meters from the vicinity of wastewater drains is unfit for human consumption. Finally, a survey by the Public Health and Engineering Department (Punjab) found 72 per cent of the samples collected from wells and tube wells

32 A survey conducted by the Federal EPA shows that tanneries located in Kasur and Sialkot in the Punjab province were discharging effluents with chrome concentrations ranging between 182-222 mg/liter (Khan 1998: 2) in comparison with the limit of 1mg/liter prescribed in the national environmental quality standards (NEQS). A loss of about 5000 tons/year in fish catch has been recorded in the River Ravi.

throughout Punjab to be biologically and/or chemically contaminated.³³

Related to the issue of per capita water availability is that of distribution and equity. This is of particular relevance for urban areas, many of which face periodic or seasonal shortages of drinking water. While such shortages are generally argued to be more acute and persistent in poorer neighborhoods, there are no data to verify or review such assertion. In some cities, especially Quetta, Karachi, and Lahore, shortages have induced a spate of investments in tubewells. However, occasional reports of falling water tables in urban areas (e.g., Farhan Anwar describes a lowering of the water table in the Malir River Basin, Karachi, to over 100 feet from its earlier level of 10-15 feet; see SDPI 1997: 16), are not backed by systematic and comprehensive data.

Another realm of inequity in the distribution of water pertains to rural-urban differences in the supply of piped or potable water; differences in per capita availability as well as quality between affluent and poor neighborhoods in urban areas; and the system of distribution of agricultural water in rural areas. While 60 per cent of the urban population has access to piped water, only 13 per cent of the rural population has such access (UNDP: 1998). Similarly, the affluent areas in urban settlements tend to receive a high volume of water, reflecting a combination of liberal provision and theft.³⁴ Rural populations depend on rainwater in ponds, rivers, and springs, as well as groundwater extracted through dug wells and hand pumps. The latter used to be considered a significant breakthrough, in that it provided potable water a low cost to poor households in urban as well as rural areas. However, a re-examination is taking place after the discovery of arsenic contamination in hand pump water in Bangladesh.

33 Sustainable Development Policy Institute. 1995. *Nature, Power, People: Citizen's Report on Sustainable Development 1995*. Islamabad.

34 For instance, per capita provision of water in Islamabad is 750 liters/person/ day, which is considerably higher than Singapore or London (Source: CDA).

The issue of equity has also surfaced at the national level, in the form of conflict between the provinces. These differences were discussed explicitly, and led to an agreement on the sharing of the Indus waters between the provinces, the Indus Water Accord, 1992. However, a number of questions remain over the calculations that underlay the Accord. In particular, environmental groups expressed concerns that the 10 MAF allocated for outflow to the sea was not sufficient to sustain coastal mangroves, as well as the freshwater balance in coastal areas. Questions were also raised regarding the optimistic projections made by WAPDA on the basis of the recent wet cycle.

6.2 Institutional Structure

The main responsibilities for managing water scarcity, overall water usage, and drainage and reclamation are vested in WAPDA and the PIDs, although selected functions are performed by provincial agriculture departments and OFWM. Issues of water quality fall within the purview of public health agencies, including the public health engineering departments, municipal and local government authorities, and the environmental protection agencies. However, the statutory responsibility in some cases is also vested in WAPDA. No government agency is directly responsible for ensuring equitable access to water resources, or even to monitor ground water mining in urban areas.

A succinct description of surface water management institutions is in Mohtadullah (1997). Briefly, WAPDA is responsible for the development of water resources and supply of irrigation water; prevention and reclamation of waterlogged and saline lands; generation, transmission, and distribution of power; operation and management of multipurpose reservoirs and dams; and land navigation. The institutional capacity acquired by the organization through implementation of salinity control and reclamation projects (SCARPs) has given it a virtual monopoly in this area.³⁵

35 Until recently, WAPDA also had a monopoly in power generation, transmission, and distribution, but the situation changed dramatically in the 1990s.

At the provincial level, irrigation departments are responsible for the operation and maintenance of the irrigation, drainage, and flood control systems. Irrigation development projects, upon completion by WAPDA are handed over to provincial irrigation departments. Other agencies involved in the management of water resources include provincial agriculture departments (PADs), the On-Farm Water Management Program (OFWM), the Flood Commissioner, and the Indus Basin Commissioner. PADs and OFWM are responsible mainly for the establishment of and support to water users' associations, technical support and improvement of watercourses, and farm drainage.

6.3 Impacts

The impact of the environmental problems around water scarcity, drainage, and water quality fall into three broad areas, loss of economic productivity, adverse impact on human health, and adverse impact on the poor.

Water scarcity is potentially a serious problem, since the historical growth of agricultural yields was brought about by extensive applications of water. Indeed, of the 50 per cent increase in agricultural output between 1971-76 and 1981-86, only 7.8 per cent was attributable to an increase in water use efficiency. In the future, as the country reaches the limits of water availability, conventional approaches of agricultural management will not suffice to increase crop yields and productivity.

Similarly, drainage problems have led to waterlogging and salinization of agricultural lands, thus reducing agricultural productivity and yields by 25 to 50 per cent.

The key impact of the decline in water quality is on human health. The commonly found bacterial organisms in polluted water are e.coli (including fecal), salmonella, staphylococci and klebsiella. The resulting infectious and non-infectious water-borne diseases are diarrhea, dysentery, cholera, helminthiasis, enteric fever, and pneumonia. Infant mortality continues to remain high while most demographic indicators have improved—a result of infants' high rate of exposure to waterborne diseases. Carter

Brandon estimates the health costs of polluted water to range between US\$ 403 and \$1,093 million per year. Other estimates attribute 45 per cent of infant deaths and 80 per cent of morbidity to water-borne diseases caused by inadequate supply of safe water and sanitation (Kardar: 1994).

The poor are more prone to suffer adverse health impacts. This is both because of their greater exposure to polluted water, as well as their inadequate nutrition, unhygienic living conditions, and lack of access to health facilities. In rural areas, the poor depend on rainwater that accumulates in ponds, in rivers and springs, as well as on ground water extracted through dug wells and hand pumps. Poor sanitation and sewerage are typically synonymous with the absence of proper waste disposal. Even piped drinking water in poor urban localities is highly contaminated. Sewage infrastructure in older and marginal neighborhoods is both poorly designed and corroded, which results in the mixing of raw sewerage and drinking water. Groundwater (through dug wells and shallow hand pumps) also contains bacterial and chemical impurities, as does stream or river water used for washing. Sharing of taps or wells with neighbors also increases the likelihood of child or infant mortality (World Bank n.d.). Dumped close to the sources of water, disease-causing pathogenic substances seep into the ground from where they find their way into the water supply.

6.4 Reform Initiatives

Essentially, the attention of policy makers has been captured by concerns that effect economic productivity, but not to the same extent by those that impact human health, equity, or poverty. However, the policy responses even in areas that have attracted attention have not been remarkably successful. A major reason is that these responses have tended almost exclusively to take the form of centralized, large-scale, infrastructural investments; and have not made adequate use of market incentives, community involvement, institutional development, effective monitoring, or awareness and constituency building.

As mentioned, the drainage issue has received a considerable attention and has helped create expertise in WAPDA. However, the situation regarding other environmental issues is quite the reverse. There is little expertise and even lesser policy driven interest in water quality—neither from the perspective of its impact on agricultural productivity, nor that of human health. Nor is there much public concern or institutional capacity in such issues as water mining, ecological costs of water management, or equitable access to water resources.

Even the system of water management has come under severe criticism from within as well as outside the country for being technically inefficient, over-bureaucratized, and financially unsustainable. Both WAPDA and the PIDs are running into operational losses, and cannot sustain their activities without persistent grants from the exchequer. This is a major reason for the flurry of reform activity in this area. Some of the goals of this reform process are similar to those of the environmental program, and there could be grounds for synergy between the two. However, there are divergent goals as well. These are best discussed by bringing up two key elements of the reform agenda.

The first relates to the periodic attempts to elicit community participation in water management. The best known of these initiatives is that of the OFWM. However, it has been criticized by NGOs for being heavy-handed and unsophisticated, led by individuals with no experience in community-based work and with no links to those with such experience. While this agenda is close to the approach adopted by conservationists on resource related issues, it is important that the expertise in community development, and even a commitment to it be recognized as a professional expertise, at the same level as engineering or economic expertise. It requires the appropriate educational and experiential background, as well as appropriate institutional and incentive systems. It should not be treated as something that can be instilled into poorly motivated and underpaid government officials through a brief training course (see Jingfors 1998).

The second point pertains to recent attempts to introduce market rationality into the system, mainly by establishing independent irrigation authorities, with a corporate attitude toward

efficiency and performance. While this can help to some extent, by freeing the institution from the control of rent-seeking politicians and bureaucrats, it is fraught with several dangerous prospects. In particular, it involves changes in the property right structure without adequate involvement of the communities in institutional design. The danger is that under existing conditions of governance, any change in the property rights regime would enable powerful groups to hijack the benefits of the reform, and in effect expropriate the rights of the poor and marginal groups. This problem cannot be addressed simply through legislation or rhetorical support. It requires the involvement of groups that have experience in working with the poor, and in working to defend the rights of the poor (see Hassan 1997).

6.5 Recommendations

The above discussion suggests that there are two types of environmental problems pertaining to water management. The ones that attracted the attention of policy makers over the years pertain to water scarcity and drainage; they happen to be ones whose impact is primarily on economic productivity. In this case, there are strong policy communities, organized around an engineering-led worldview. The challenge in this case is to induce a switch towards conservation-based approaches. These would be a combination of economic, institutional, and participatory approaches.

A second area is that where the impact of the problems is felt mainly on human health, quality of life, and poverty. These pertain largely to issues of water quality and equity. They tend to be the responsibility of weak municipal or other organizations. Here, the goals need to be considerably different. The goal here is to create a strong political constituency behind the initiative—through research, advocacy, community development, and networking—as well as a strong policy community that can undertake the research and provide advice across a range of issues. Finally, there is a need to institute better monitoring systems so that information for research, policy development, and advocacy is available with greater facility.

There is differential access to both irrigation and drinking water, with the poor being the most deprived. Improving access is likely to have environmentally beneficial impacts, as better distribution of an existing stock means less wastage. The notion that service provision must revert to the private sector is becoming increasingly less palatable, given the fears that lack of regulatory oversight and market monopolization (with inevitable price hikes) will replace one form of inequity with another. While there is a diminishing rationale for treating water as a free good, provision of this resource needs to continue to remain in the public sector—albeit under stricter norms of accountability.

Chapter 7

Agriculture

Sixty five percent of Pakistan's population lives in rural areas and depends for its livelihood on agricultural lands, rangelands and forests. Agriculture accounts for more than 25 per cent of GDP, more than half of employment and, directly or indirectly, 70 per cent of export revenues. It is also significant in all programs of poverty alleviation.

Between 1981-82 and 1996-97, Pakistan's total cultivated area increased from 20.30 to 21.59 million hectares. The biggest increase was in the area under cotton, which rose from 2.1 to 3.0 million hectares in this period. Among smaller crops, the area under fruit and vegetables also doubled from 0.495 to 1.001 million hectares. Cotton, fruit orchards, and vegetables also happen to be the largest users of chemical pesticides. The published figures for pesticide consumption in the early 1980s appear to be somewhat questionable. However, from about 10-15,000 tonnes from the middle to the end of the 1980s, there was a quantum jump to 20-24,000 tonnes during 1991-94 and another to 43-44,000 during 1995-98. Between 1980-81 and 1997-98, the consumption of chemical fertilizer increased from 1.035 to 2.602 million nutrient tonnes.

7.1 The Green Revolution

Since the 1960s, agricultural policies in Pakistan have been defined by the so-called "Green Revolution" strategy of agricultural growth, namely the application of agro-chemicals, irrigation water, and often agricultural machinery to high-yielding crop varieties. This strategy was premised upon a sufficiency of both land and water. It benefited from the launching of major irrigation schemes (Mangla, Tarbela) under the Indus Basin agreement. It led to dramatic increases in per acre yields, initially of wheat, maize, and rice, and later of cotton. However, these increases did not come without both immediate

and long run costs. The nature of water management has encouraged wastage, and has contributed to land degradation due to waterlogging and salinity. Excessive use of fertilizers and pesticides has given rise to water pollution, soil degradation and health problems. A good review of these effects is in Banuri (1998) and Khan (1999).

While it is difficult to link environmental degradation directly with the performance of public enterprises, wastage and inequity in the distribution of inputs has damaged the environment. Also, research and extension is rarely geared towards preempting or mitigating such impacts. Partly, this is because the concerned institutions are in the public sector and pursue inflexible research agendas.

It also goes without saying that rent seeking is a pervasive feature of procurement, distribution and export activities.³⁶ The management of administered (support) prices without adequate margins to cover costs tends to keep public enterprises financially insolvent. Generically, the problem is rooted in the absence of accountability. Assured recourse to government funding leaves little impetus for instituting technical and management improvements, while attempts to address problems of overstaffing, non-merit based appointments and endemic corruption are politically contentious.

36 Public enterprises play a pervasive role in Pakistan's agriculture, almost completely dominating the procurement, production, distribution and export of agricultural commodities. The National Fertilizer Corporation controls half of all nitrogenous fertilizer and all of the phosphate fertilizer production in Pakistan and has rapidly extended its fertilizer marketing and distribution facilities. The Punjab Seed Corporation (PSC) dominates the seed market, distributing its seeds through the Pakistan Agricultural Development and Supplies Corporation (PADSC). The provincial food departments and their federal counterpart, the Pakistan Agricultural Storage and Supplies Corporation (PASSCO) implement the government's food procurement and distribution policy. The Rice Export Corporation (RECP) implements the government's rice procurement program and exports rice at the approved price. The Cotton Export Corporation (CEC) held the monopoly for cotton exports until 1987 when the private sector was allowed to enter the business. The government also administers textile export quotas. In addition, the government's vast federal-provincial network—with the Pakistan Agricultural Research Council (PARC) and the National Agriculture Research Center (NARC) at the apex—lead agricultural research and extension.

7.2 Resource Impacts

The prospects of future agricultural growth in Pakistan are limited by two main constraints—land and water—of which water is more significant. As mentioned, the high rate of agricultural growth in the 1960s and 1970s was associated with a rapid expansion in water availability. However, given that the total water offtake already corresponds roughly to average water availability, the prospects of future agricultural growth are considerably limited. At a minimum, water scarcity constitutes strong grounds for improving use efficiency. It may also affect cropping practices, which involve intensive applications of water and chemical inputs to high yielding crop varieties. The emerging scarcity of water may limit the usefulness of such practices, which are already being criticized on the grounds of their environmentally adverse impact on soils and water.

The most immediate cost of the system of water management is waterlogging and salinization of agricultural lands because of inadequate drainage. As a result, over the last 40 years, a significant component (between 30 and 70 per cent) of the development allocations for the water sector has gone to drainage and reclamation. These correspond to an average of 4 per cent (ranging between 2 and 8 per cent in different plan periods) of the entire public sector development program.

Besides the pattern of water use, environmental impacts of agricultural production also stem from the use of agricultural chemicals, namely pesticides and fertilizer. Cotton, which is the largest single user of pesticides, experienced dramatic increases in output and yields after 1980 in what can be called the second phase of the Green Revolution. Between 1980-81 and 1991-92, cotton output tripled, from 4.2 to 12.8 million bales (although it declined to 8-10 million bales thereafter), and yields increased by 150 per cent, from 2 to 4.5 bales per hectare. In the same period, pesticide use grew steadily, holding at about 12-14,000 tonnes during the mid- to late-1980s, 20-24,000 tonnes from 1991-94, and 43-44,000 tonnes during 1995-97. Over 65 per cent of the pesticides were applied to cotton.

The expansion was led in part by policy changes. Pesticides trade policy was liberalized steadily. In 1992, the high regulatory duty on pesticides was bypassed by exempting imports of pesticides under generic names, branded imports continued to be subject to regulatory duties. While this was designed to give relief to domestically packaged products, it also encouraged adulteration. This policy was revised in 1995, but in order to provide relief from the high duties, the 1971 Pesticides Ordinance, which required that all imported pesticides be registered and in use in the exporting country, was abolished. It led to aggressive marketing campaigns by multinationals, and combined with a receptive farming community and support by government officials, has led to a doubling of pesticide use. There are also indications that some of the pesticides are of dubious quality and with highly adverse environmental impacts.

Another set of concerns pertains to chemical fertilizers. Between 1980-81 and 1997-98, fertilizer consumption has increased 160 per cent, from 1 million to 2.6 million nutrient tonnes. However, trade policy on fertilizers has been comparatively benign from an environmental point of view. While all fertilizers have been imported duty free historically, fertilizer subsidies declined from 10.5 per cent of all subsidies to just 0.9 per cent in 1995 and are currently available only on phosphatic fertilizer input.

7.3 Reform Initiatives

As the benefits of the Green Revolution began to peak and production began to level off a need for reassessing strategy became imperative. Factors contributing to the deceleration in production were limits to land expansion at the extensive margin (NCA 1987); declining water availability, evidenced in the declining water table in many canal commands (NCA 1987), diminishing returns to fertilizer use; increasing pest resistance to pesticides; and the virtually complete diffusion of the Green Revolution technology. Physical constraints to production were difficult to overcome in an institutional environment ill equipped to deal with them.

The key features of the institutional milieu of agricultural development are a set of sophisticated and interlocking organizations, engaged in agricultural research, extension, education, input provision, and infrastructure development. Their orientation has historically been toward the maximization of yields, and not toward the conservation of resources or the sustainability of yields. This attitude has persisted despite mounting evidence of land and water constraints, their disproportionately adverse impact on small farmers and the resulting environmental degradation. While these suggest a switch to environmentally benign and socially equitable solutions, public sector interventions continue to be modeled on large-scale, top-down, and technology driven programs from the past. There is a lack of understanding of the systemic links between economic, social and environmental forces.

However, the persistent crisis in agriculture has triggered a search for solutions and policy reforms (NCA 1987). These include the ultimately unsuccessful efforts to integrate the agriculture and irrigation bureaucracies; institutional restructuring of various components of these systems; and the introduction of market based policies and incentives.

A common problem is weak reform implementation, reflecting lack of government ownership. Policy reform reversals often occur once donor funding is withdrawn. An example of this is the irrigation sector where the provincial governments frequently renege on maintenance commitments. Recent institutional approaches have sought to address this problem. Specifically, this entails decentralizing public sector management, increasing stakeholder participation in operations and maintenance and delegating water pricing responsibilities to autonomous/private bodies (Faruqee and Ahmad: 69: 1999). It remains to be seen whether such an approach will work, given the existing inequitable land distribution patterns

7.4 Impacts on the Poor

The main impact of environmental degradation in the agricultural sector comes from the degradation of their resource

base, namely land and water, and the impact on human health because of agricultural runoff.

Resource degradation and the loss of livelihood places pressure on other resources. The marginalization of poor and landless farmers has produced adverse environmental impacts as evidenced in the high rate of deforestation, biodiversity loss and rangeland degradation. Land hungry rural populations have moved up into marginal lands, into erosion prone hill areas and into fragile semi-arid areas that have traditionally served pastoral groups and their herds. This has produced conflicts over land access. Consequently, low-quality pasture is now being used more intensively and pastoralist herds, forced to graze post-harvest crop residues are not fertilizing agricultural land as much as before. As resources come under pressure from increasing numbers of land-poor and landless rural people, traditional management, tenure and rights systems face collapse. Thus, grazer rights are being encroached upon, tree rights are subsumed under land rights, leading to deforestation and land clearing and state lands are under constant threat from farmers, loggers and fuel wood collectors.

Another manifestation of such marginalization is rural to urban migration, represented by the rate of urban population growth, presently in excess of 4 per cent. Growing populations are straining the capacity of the urban environment to absorb the wastes and emissions they produce. In turn, the unassimilated pollutants emanating from poor sanitation, lack of clean water, industrial, energy and transport emissions have exposed such populations to health hazards.

7.5 Policy Options

The policy options in the agriculture sector need to contend with the existence of a strong and entrenched policy community, with fixed and often archaic attitudes toward problems. In line with the recommendations of the rest of this report, the re-orientation of this community toward sustainable agriculture requires at least three types of changes. These involve the functioning of the environmental ministry as a public health

organization, as a supporter of community development, and as a technical assistance organization.

- **Public health concerns:** Concerns the quality of product, and seeks to eliminate incentives for producers or distributors to supply inferior products. This is the case with sub-standard and banned pesticides in Pakistan where adverse impacts have been documented on soil quality and health. At present, the government is more inclined to protect the interests of pesticide distributors than to penalize them for environmental infractions.
- **Technical assistance for sustained productivity growth:** Ensuring that public sector research institutions make the transition to natural resource management research with a systems perspective. The key research areas are integrated pest management (IPM), integrated crop management (ICM), genetic engineering and organic agriculture (Banuri: 1998). Further, effective dissemination is a necessary adjunct to such research, with a special focus on small farmer outreach
- **Community development and rights protection:** The existing configuration of tenuous property rights, land concentration and polarization is inimical to resource conservation. Insecure tenure detracts from the incentive to improve land, while large land holdings means that large tracts of land lie fallow at any point in time and are susceptible to waterlogging and salinity. Land reforms are politically unpalatable and, at best a long-term solution. The short-to-medium term measures are: enforce the security of tenure provisions of the 1972 Land Reform Act; streamline the land titling and registration process; introduce a land tax to improve efficiency of land use and; strengthen the fixed rent/leasing system by instituting legal checks against appropriation (Mahmood: 69: 1999)

Table 7.1
Comparative Data on use of Agricultural Chemicals

Area covered by ground plant protection measures		
	1991-92	1995-96
Actual area (000 hectares)	4521.2	7166.8
Per cent of cropped area	19.6	31.8
Consumption of Pesticides (tonnes)		
	1990	1995
	14,742	44,872
Annual fertilizer off-take (000 nutrient tons)		
	1988-89	1996-97
Nitrogen	1324.9	1985.1
Phosphorus	390.4	419.5
Potassium	24.5	4.5

Source: Government of Pakistan. 1998. *Agricultural Statistics of Pakistan 1996-97*

Chapter 8

Industrial and Urban Pollution

Besides resource degradation, the major environmental problem facing the country is air and water pollution. There are four broad sources of such pollution: industrial emissions and effluent (including from power plants), vehicular emissions, municipal wastes, and agricultural runoff. In this chapter, we will describe briefly the first three. Agricultural runoffs have been described in the preceding chapter.

8.1 Industry

The industrial sector is considered the leading economic sector in developing economies. However, it is also associated with growing air and water pollution. The result is that environmental action has often been perceived as inimical to industry, and therefore to the development process. This is probably the main psychological basis for opposition to the environmental agenda in policy circles. Recent studies that claimed to show that pollution (and environmental degradation in general) rises with economic growth before declining—the so-called Environmental Kuznets Curve Hypothesis—have been extremely harmful in this regard. They have provided an additional basis for the opposition to resource conservation and pollution abatement programs.

In Pakistan, from a minuscule base at the time of independence, the industrial sector has grown at rates of 7-10 per cent per annum to reach virtual parity with the agricultural sector in terms of value added. The bulk of the industrial production is in cotton and textile products, although leather, cement, paper and board, and chemicals have also grown quite steadily. In 1970-71, 62 per cent of the industrial value added came from three groups:

textiles, tobacco, and food and beverages. By 1990-91, this share had fallen to below 50 per cent, while chemicals, petroleum products, and machinery contributed over 40 per cent.

In terms of the impact on the environment, textile processing is at the top of the list (mainly on account of its size), followed by leather, cement, chemicals, and paper. Although there is no systematic survey of the volume, sources and characteristics of industrial effluent discharges, some site-specific work undertaken by different agencies shows the magnitude of these discharges. According to the IUCN *Environmental Overview 1998*, the manufacturing sector in Pakistan consumes 23.14 million tonnes of oil (16 per cent of total national consumption), and generates 285 tonnes of CO₂, 162 tonnes of NO_x, 378 tonnes of SO_x, and 4,400 tonnes of particulate matter every year.

Most of the effluent is released directly into the water bodies or the urban sewerage systems. Recent studies of 150 industrial units, completed by the Federal and Provincial EPAs reported high levels of pollution, including chromium (182-222 mg/l) and COD (5,002-7,320 mg/l) in Kasur and Sialkot. PEPA reports a survey that shows tanneries of Kasur and Sialkot to be evacuating effluents with chrome concentrations of about 182-222 mg/l against the NEQS limit of 1 mg/l, and chemical oxygen demand (COD) ranging 5002-7320 mg/l, against a limit of 150 mg/l (Khan 1998). Similarly, a survey of the impact of industrial and municipal pollution reports a loss of about 5,000 tons of fish catch in the Ravi River (Khan 1997). Reports of coastal pollution show the impact of oil, municipal and industrial discharges at Karachi, and a dramatic decline in fish species.

The wastewater entering Ravi River from Shad Bagh sewerage drain and Babu Sabu drain have biological dissolved oxygen (BOD) of 160 and 280 mg/l and COD of 390 and 645 mg/l respectively. The situation does not vary significantly for other drains such as Hadyara drain, Deg Nullah and Chicho Ki Mallian drain. The concentration of toxic metals is also very high in Shadbagh main out fall and Chicho ki Mallian drains (*Compendium 1998*: 225-41).

The main initiative on industrial pollution was in the form of successive legislation, and the introduction of the idea of the

environmental quality standards. Given, however, the low likelihood of the NEQS being implemented effectively, the government wisely decided to adopt a consultative and participatory route. In this process, the NEQS were reviewed and revised through a task force with strong representation from industry. The policy package for the implementation of these standards was also developed through the same participatory process. It led to a landmark decision by the general assembly of the FPCCI, Pakistan's umbrella industrial association, to recommend the imposition of a pollution charge on industry, the proceeds of which to be used for pollution abatement and technical assistance. Unfortunately, the persistent instability in the government inhibited building up on this initiative. However, with the return of a semblance of stability, it is likely that the process will be renewed.

8.2 Urban Wastes

In many ways, water pollution and land degradation from municipal wastes is Pakistan's most visible and important environmental problem. The growth rate of the urban population has consistently been higher than that of rural areas, and while it has slowed down during the 1981-98 period, it is still 3.5 per cent per annum. The result is that the share of the population living in urban areas has increased from 22.5 per cent in 1961 to 32.5 per cent in 1998. In 1981, only three cities (Karachi, Lahore, and Faisalabad) had more than 1 million people. By 1998, this number had risen to 7 cities, with an eighth just under 1 million. The number of cities with over 200,000 people has doubled, from 12 in 1981 to 23 in 1998.³⁷

These intermediate and large cities produce between 0.3 and 0.6 kilograms of solid waste per day, of which 7-10 per cent is non biodegradable (plastics, metal, glass), while between 30 and 35 per cent is organic waste (food waste, animal waste, and leave and grass). The major source of water pollution and waterborne

37 In many ways, this is a more disturbing trend, because these "intermediate" cities lack the basic municipal structure or the market expertise to handle the rapidly growing waste volumes.

diseases are the solid and liquid excreta and kitchen and wash wastewater. The NCS reports that 12.5 million tonnes of waste are produced in the country per year, corresponding to a biological oxygen demand of 2,265 tons per day. Of this, 30 per cent is produced in urban areas, and 70 per cent in rural areas.

Among urban areas, per capita generation of solid waste is highest in Karachi followed by Hyderabad and Peshawar, estimated at respectively 0.613 kg; 0.563 kg and 0.489 kg of waste every day.³⁸ On average about 30 per cent of the waste is organic material (food and animal waste, leaves, grass, and wood), and another third to a half consists of fine particles. However, the proportion of non-biodegradable items (plastics, metals, and glass) is also of the order of 6-8 per cent.

While specific data on waste treatment and disposal are not available, the NCS estimates that only 52 per cent of the urban waste is deposited into sewers and the remaining (approximately 4,000 tons) is deposited “on the roadside, into waterways, or incorporated in solid waste” (PNCS 1994). However, Hassan (1997) argues that the bulk of this, and indeed even that purportedly collected by municipal agencies, is in fact collected and recycled by the informal sector. If this were not the case, the cities would have drowned in the 12.5 million tonnes of waste produced every year.

Hassan (1997) also provides a heuristic picture of the processes involved in waste collection by municipal agencies and the informal sector, and criticizes urban plans, including those pertaining to pollution abatement and environmental conservation, for ignoring the reality of these processes. Instead of working with the informal sector to improve its efficiency and coverage, all plans either ignore this sector, or try to destroy it, and thus end up producing no visible impact on the quality of life in the cities.

The main proposal here is for the environmental agencies to adopt a public health role in regard to the above concerns. This role needs to be developed in collaboration with and the active

38 However, ADB estimates a very high waste generation of 1.05 kilograms per head in Karachi, which is two to three times the average for other large cities in Asia. See *Compendium*, Table B-17.

participation of the institutions involved, especially the municipal agencies, health institutions, medical colleges, NGOs, and informal sector organizations.

8.3 Air Pollution

The incidence of non-stationary source pollution has increased rapidly in recent years. According to the NCS, the average Pakistani vehicle emits 20 times as much hydrocarbons, 25 times as much carbon monoxide and 3.6 times as much nitrous oxide in grams per kilometer as the average vehicle in the US. Carbon monoxide levels in the range of 8-30 parts per million (ppm) and 6-40 ppm have been recorded for Lahore and Karachi, respectively. Ambient lead levels in Karachi have been measured at between 0.024 and 0.13 micrograms per cubic meter, which is high, by World Health Organization/World Bank criteria.

The NCS (1992: 82) reports that in 1987-88 the industrial sector was emitting about 26.68 million tons of CO₂, and 423,000 tons of SO₂. In the same year, vehicular emissions were reported to be 10.254 million tons of CO₂ and 157,000 tons of SO₂. However, there is hardly any earlier information available on other pollutants such as cadmium and lead. (Table 8.1)

Table 8.1
Estimated Air Pollutants by Sector
(Thousand tonnes)

SECTOR	1977/78			1987/88			1997/98		
	CO ₂	SO ₂	NO _X	CO ₂	SO ₂	NO _X	CO ₂	SO ₂	NO _X
Industry	12,308	19	n/a	26,680	423	n/a	53,429	982	n/a
Transport	7,068	52	n/a	10,254	57	n/a	18,987	105	n/a
Power	3,640	4	3	11,216	95	10	53,062	996	76
Domestic	16,601	5	n/a	24,054	16	n/a	39,980	40	n/a
Agriculture	845	5	n/a	4,490	28	n/a	6,368	40	n/a
Commercial	1,726	11	n/a	2,587	13	n/a	4,261	25	n/a

Source: NCS Sector Paper on Energy

Note: n/a: not applicable

Traditionally air pollution was considered to be an urban phenomenon. More recently, with the expansion of industry in the rural areas, penetration of transport into rural areas, and the growth of brick kilns, air pollution is fast becoming a rural problem as well, particularly in the peri-urban areas and along the major national highways. For instance, it would be difficult to find an uninhabited stretch of more than five miles along the Grand Trunk road between Lahore and Islamabad.

In terms of health effects and their incidence on the poor, air pollution ranks equally with water pollution. Brandon (1995) estimated the cost of health impacts alone (morbidity, mortality, IQ level loss) resulting from air pollution in Pakistan. It ranged between US\$ 233-368 million per year. Such figures do not include the environmental and economic cost of air pollution. The cost of remediation for air pollution is estimated to be US\$ 119.49 million per year (Rogers: 1997). Tables 8.2 and 8.3 provide respectively the data used by Brandon (1995) and that published most recently by the FBS. Unfortunately, the figures are not strictly comparable.

Table 8.2
Air Pollution Data Used by Brandon (1995)

Pollution Source	Karachi	Lahore
Particulate Matter (PM10)	191.79	125.39
Sulfur Dioxide	96.99	57.72
Ozone	--	0.03
Lead	5.00	--
Nitrogen Dioxide	0.55	0.02

Source: Brandon (1995)

Table 8.3
Air Pollution in 1996

	Site	Ozone Ppb	SO ₂ ppb	CO Ppm	NO Ppb	NO _x ppb	Meth ppm	NMETH ppm	PM ₁₀ µg/m ³	TSP µg/m ³
Lahore (June 1996)	Road Side	39.2	4.2	3.8	13.5	43.5	3.6	0.3	465	780
	Residential	27.4	2.3	2.1	7.4	21.3	4.7	0.1	210	470
	Industrial	34.4	3.1	2.7	11.4	24.5	4.1	0.2	290	585
	Sub urban/rural	31.2	1.6	0.9	5.2	8.9	4.3	0.1	260	440
Faisalabad (August 1996)	Road Side	31.6	6.8	2.9	8.2	38.9	4.1	0.3	490	870
	Residential	22.2	4.2	2.0	6.3	17.3	3.6	0.1	330	560
	Industrial	26.7	5.5	3.0	7.1	30.2	3.3	0.2	440	685
	Sub urban/rural	24.3	2.3	0.9	5.6	8.1	4.8	0.1	185	290
D.G. Khan (December 1996)	Road Side	19.7	2.6	1.4	5.7	14.5	2.8	0.2	750	1240
	Residential	16.9	2.1	1.2	4.5	12.6	2.1	0.1	413	810
	Sub urban/rural	18.0	1.2	0.6	3.6	7.1	3.6	0.1	790	1350

Source: Federal Bureau of Statistics. 1999. *Compendium on Environmental Statistics of Pakistan 1998*. Islamabad

8.4 Impact on the Poor

The poor are most exposed to air and water pollution, and least able to protect themselves. Of the estimated 2.7 million deaths each year from air pollution, 2.2 million are from indoor pollution, and 80 per cent of the victims are the rural poor in developing countries. Smoke from fuel wood is more dangerous to health than tobacco smoke, but every day women have to spend hours cooking over smoky fires. Leaded petrol, used more in developing and transition economies than in industrial countries, is crippling human health, permanently impairing the development of children's brains. In Bangkok, up to 70,000 children are reported to be at risk of losing four or more IQ points because of high lead emissions. In Latin America, around 15 million children under two years of age are at similar risk (UNDP: 5: 1998)

Low income neighborhoods mushroom around industrial areas and power plants, where exposure to air pollution is high. The poor also work long hours in factories in unsafe conditions; in particular, women and children are the most vulnerable, exposed to dust and chemical inhalations in sweatshops and household industries producing textile items, carpets and leather goods. Traffic congestion and the resulting vehicular emissions are becoming an increasingly serious problem in the big cities. Poor communities are the most exposed to auto-emission and other

toxic fumes, as they tend to live close to the main trunk roads. High auto-emissions are also linked to affordability; the poor can not afford to travel in vehicles using cleaner but more expensive fuels.

The incidence of respiratory diseases and lead poisoning (predominantly among children) from mobile and stationary source emissions is escalating rapidly. Factors which further increase the vulnerability of the poor are poor nutritional intake, crowded living conditions (which increases the risk exposure) and lack of access to good medical facilities. Ultimately, those who are the most disadvantaged are made more so. The probability of escaping poverty, or enhancing their range of choices in their lifetime is reduced for them and the ability to pass on a better life to their children is also reduced.

Chronic respiratory infections, often related to smoky indoor atmospheres due to biomass use for cooking and heating are common in Pakistan's rural areas and in urban slums. Women suffer from much higher health risks as cooking is done exclusively by them; as do the children and infants who tend to stay close to their mothers.

In the rural areas, poor uneducated farmers are more exposed to the detrimental effects of chemical agricultural inputs. Excess use, drifting sprays, leaky applicators and the lack of knowledge of handling dangerous substances simply enhances the risk of ill health. Similarly, women and children engaged in cotton picking, the cash crop for which pesticide use is the greatest, are exposed to numerous ailments. These include carcinogenic diseases, enzyme imbalances, skin and allergic reactions, lung diseases, sterility, cataracts, memory loss, change in the central nervous system and damage to the immune system. About 90% of the total fungicides and pesticides are consumed by the cotton crop. According to a 1991 sample survey of 88 cotton pickers (mostly women), only 1% were safe from the hazardous effects of pesticides. Seventy four percent had blood acetylcholine esterase (AChE) inhibition between 12.5 – 50% and 25% were in dangerous condition where blood AChE inhibition was between 50-87.5%.

Chapter 9

Energy Generation and conservation

Energy is one of the core policy issues in Pakistan. This is in part because of the political sensitivity of governments to load shedding, in part due to the large volume of international investment anticipated in the energy industry, and in part due to its relationship with other major sectors of the economy—especially the fact that economic growth is linked so closely with energy sector growth.

9.1 Background

At present energy policy is dominated by a preoccupation with increasing energy supply, whereas the key concern of the environmental policy community is with rationalizing its use. Recent reforms have sought to inject economic sensibility in the energy arena by seeking to strengthen key regulatory institutions, promoting the use of market instruments, and investing in institutional reforms. However, even in this domain, the major result is a dramatic increase in energy prices—with consequent concerns about equity and energy security—and much remains to be done.

Nonetheless, it is possible for the economic reform and environmental agendas to reinforce each other. Both share the goal of inducing energy conservation, attracting additional foreign resources, strengthening monitoring and regulatory institutions, promoting equity and energy security, and enhancing the capacity of the government to implement policy effectively.

The relationship between energy and the environment depends on the particular source of energy: electricity, oil and gas, and biomass. Table 9.1 gives the data on different sources of energy used in Pakistan over the 1990s. It brings out the fact that

the three sources mentioned here are of similar importance in the overall energy budget of the country. However, each poses a different set of environmental problems.

Table 9.1
Energy Consumption by Source
Million tonnes of oil equivalent per year

	Petroleum	Gas	Electricity	Firewood	Dung Cake	Crop Residues
1990-91	10.209	10.106	3.342	--	--	--
1991-92	11.239	10.626	3.701	10.637	3.613	2.815
1992-93	12.283	11.126	3.970	--	--	--
1993-94	13.494	11.836	4.105	--	--	--
1994-95	14.223	11.768	4.361	--	--	--
1996-97	15.857	12.645	4.638	--	--	--
1997-98	15.846	12.969	4.815	--	--	--

Source: *Compendium, Tables A-62, A-69, A-73, A-75, A-81*

Fossil fuel based electricity generation results in air and water pollution; large hydroelectric projects have adverse social and ecological consequences; and nuclear plants pose risks of safety and contamination. Oil and gas consumption for transport and home heating also produces air pollution. Fuelwood or biomass energy leads to deforestation. Besides these, the energy sector faces the challenge of growing energy demand and wastage, and energy security and poverty.

In summary, the main issues in the energy and environment interface are the following:

- Switch to **clean energy sources**, namely solar, wind, small hydro, co-generation, and renewable energy technologies;
- **Emissions reduction** and effluent treatment for thermal power plants, as well as vehicles and mobile sources;
- **Conservation of energy** through efficiency improvements, building control, better governance and transparency, and improved urban planning;
- **Protection of the environment** and social dimensions in large dam projects;
- **Protection of forests** against the impact of excessive fuel wood use;

- **Environmental security**, namely ensuring adequate access of energy resources to poor and vulnerable communities, protection of these communities against unanticipated shocks.

A broad range of measures is needed to achieve these goals. These include the adoption of integrated energy assessment and planning, market incentives for energy conservation, access to concessional global resources for the switch to renewable technologies, community development and social mobilization for the protection of forests and promotion of energy security, technical assistance and market incentives for emissions abatement, and the proper use of EIAs and price signals to protect the environment.

Many of these goals and measures were set out in the NCS (p. 215). However, it is not clear whether any of these have been taken up in earnest since the adoption of the NCS. In particular, there is little evidence of collaborative effort with the other ministries and agencies involved.

9.2 Institutional Structure

There is considerable expertise and experience on energy related issues in the country. This is reflected in the large number of governmental and private organizations active in the area. Besides the ministries of water and power, and petroleum and natural resources, these include regulatory institutions (NEPRA, PPIB, PEPCO), public sector organizations (WAPDA, SGTC, OGDC, PRL, NRL, and PSO); multinational corporations (Shell, ESSO, HUBCO, and KAPCO); consulting agencies (HBP), and research institutions (HDIP).

Expertise on electricity generation and transmission was concentrated in WAPDA, which led the national effort to expand power supply from a minuscule base to the current level of 14,500 gigawatts. While the initial focus and in many ways the institutional ethos of WAPDA was on hydropower units, the momentum over the last two decades has shifted (probably as a result of the stalemate over the Kalabagh Dam project) toward thermal energy. Table 9.2 gives the breakdown of different sources of electricity production in the country. In the 1990s, the

shift of momentum also allowed for private (mainly foreign) investment in the energy sector. Correspondingly, and mainly as a result of malgovernance, there has been a dramatic decline in the solvency as well as the institutional capacity of WAPDA.

Table 9.2
Electricity Generation by Source (000 GWH)

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97
Hydel (WAPDA)	18.3	18.6	21.1	19.4	22.9	23.2	20.6
Thermal (WAPDA)	16.1	19.0	19.1	22.6	22.9	25.2	19.1
KESC	6.3	7.4	7.9	8.1	7.3	8.0	7.5
KAPCO	--	--	--	--	--	--	5.1
HUBCO	--	--	--	--	--	--	6.3
Nuclear	0.4	0.4	0.6	0.5	0.5	0.5	0.3
Total	41.0	45.4	48.8	50.6	53.5	57.0	59.1
Annual growth (%)	8.98	10.72	7.29	3.88	5.74	6.35	3.82

9.3 Energy Use Patterns

From a situation of energy balance, or at least effectively suppressed excess demand for energy in the 1960s and 1970s, the country began to experience persistent deficits during the 1970s, leading to the endemic nature of load shedding. However, the commissioning of two major thermal energy plants in the 1990s (Kot Addu and Hub), and the dramatic upsurge in energy prices has reduced the deficit, and even created a surplus in some parts of the year. However, during the decade of the 1990s, electricity supply grew at an average of just over 6 per cent per annum. In contrast, the NCS estimates energy demand to be growing at 10 per cent per year. The existence of the deficit reveals itself in other ways as well, especially the massive pressure on fuel wood resources.

Currently, the total consumption of energy is about 42 million tons of oil equivalent (Table 9.3).³⁹ Of this about half is consumed directly by households, mainly (four-fifths) in the form

39 The table gives a figure of 51 million TOE per year. However, this is slightly misleading, because it includes the 9.35 million TOE of natural gas and petroleum products used to generate electricity. The deduction of this source of double counting leaves a net energy supply of 42 million TOE per year.

of traditional fuels (firewood, biomass, and charcoal).⁴⁰ Industry and transport consume about 18 per cent each and agriculture about 9 per cent.

Table 9.3
Energy Consumption by Source and Sector
TOE/year

	Electricity	Petroleum	Gas	Coal	Firewood	Other	Total
Domestic	1,444.6	525.9	2,702.4	*119.0	*10,637.4	*6,429.1	21,868.4
Commercial	245.2	--	430.6	--	--	--	675.8
Power		4,990.0	4,206.4	157.5	--	--	9,353.9
Industrial	975.8	2,101.8	2,786.5	1,427.8	--	--	7,291.9
Agricultural	577.1	280.1	2,835.1	--	--	--	3,692.3
Transport	1.5	7,528.6	8.4	--	--	--	7,538.5
Government	234.5	419.9	--	--	--	--	654.4
Total	3,478.7	15,846.2	12,969.4	1,604.3	10,637.4	6,429.1	51,075.2

Source: *Compendium 1998*, Tables A-75, A-61, A-69, A-66, A-81

Note: * 1991-93 estimates from HESS

Estimated household consumption of 172 kilograms of oil equivalent per capita per year (during 1991-93) is well below the average for industrialized countries. The estimates for household consumption are taken from the HESS database (*Compendium* Table A-80), and are summarized in Table 9.4.

40 However, Khan (1997) reports a declining share of biomass-based fuels, from 70 per cent of the total in 1976 to 45 per cent in 1995. It is not clear whether the two figures are comparable.

Table 9.4
Per Capita Energy Consumption by type of fuel and income

Kilograms of oil equivalent per capita per year

	Low income Less than Rs 18,000/yr/HH	Middle income Rs 18,000-45,000 per year per HH	High income Above Rs 45,000 Per year per HH	Total
Urban (kgOE/capita/year)				
Modern fuels	27.98	46.40	86.68	56.06
Traditional fuels	97.94	71.50	45.67	71.43
Total	125.92	117.96	132.35	127.49
Rural (kgOE/capita/year)				
Modern fuels	7.33	9.16	13.72	9.51
Traditional fuels	182.95	187.71	164.69	182.41
	190.28	196.87	178.41	191.92
Total (kgOE/capita/year)				
Modern fuels	11.56	22.03	44.56	24.22
Traditional fuels	165.86	153.12	116.92	148.56
Total	177.42	175.15	161.48	172.78

An important point that emerges from this data is the lack of significant difference between the *total* per capita consumption in different income classes. However, there are significant differences in their consumption of modern fuels, especially in urban areas, where the average consumption of the high income group is more than thrice that of the low income group, and almost twice the middle income group. The difference is less pronounced in rural areas; indeed, it brings out the poverty of rural areas by demonstrating the low level of high-quality fuels deployed there.

9.4 Energy Security

In other words, the main difference between income classes lies not in their aggregate energy consumption, but in the quality (and presumably the efficiency) of fuels they consume. Modern fuels are more convenient, more efficient, and have a broader range of applications than traditional fuels. There is very little research on improving the efficiency and convenience of traditional fuels, and thus enhancing the quality of life of the poor without the high-cost, and currently unavailable options. There is also no research on reducing the energy needs of the poor, for example by creating

knowledge about better building practices, or by developing low-cost, high efficiency building materials.

It should also be noted that 51 per cent of fuelwood users in urban areas and 61 per cent in rural areas rely only on collected wood. This suggests that fuel wood provides the poor with access to energy outside of the commercial realm, and thus is the main source of energy security in the country. This point has serious policy implications. The most important is that neither the forestry policy of the country nor the energy policy bears any relevance to the conditions faced by the vast majority of households. Considering the central role that forests play in the energy security of the country, it would not be amiss to regard this as the primary if not the exclusive function of forests. However, the nature of forestry policy will then have to be altered radically to ensure that this responsibility is discharged on a sustainable basis. Second, while the current impact of this arrangement on the state of the forests is hardly to be lauded, the fact is that the current energy policy has not demonstrated any alternative vision that could protect the forests without endangering energy security or risking civil conflict. There is no effort to recognize the needs of this group and ensure that their security is not threatened in any new dispensation.

9.5 Emissions and Pollution

Besides energy security, the major environmental concern in this domain is that of emissions from power generation and the burning of fossil fuels. This depends on the mix and quality of fuels employed, the technologies used to control or abate pollution, and the quantum of energy used. Energy related emissions have both a global and national dimension. From a global warming perspective deforestation results in the loss of sinks. However, the emissions per se contribute little to global warming as Pakistan's per capita emissions are well below the global average (Khan: 1997). The problem is primarily a national one and is concentrated at two sources. The first are areas of high urban density: the growth of urban agglomerations and their proximity to industrial areas generates high levels of emissions from mobile and stationary sources. The second source of emissions is combustion of biomass

in poor households—both in rural and urban areas. The health and productivity losses caused by such emissions have been documented in detail (Brandon: 1995). In both cases, policies aimed at achieving fuel consumption economies also produce salutary outcomes for the poor.

Fuel use and emission patterns provide the primary test of the conventional plank of sustainable energy policies. Recent scenarios (see HBP 1997) assume that the emerging scarcities of traditional fuels, combined with rising incomes will induce a switch to modern fuels, but not enough to abate the pressure on biomass stocks. The scenario predated the discovery of new gas fields, and assumed a rapid depletion of gas reserves, thus enforcing a shift to other sources: imported oil, domestic coal, and hydroelectricity.

The HBP scenario predicts a 5.9 per cent annual growth in fuel consumption. Petroleum products register the largest growth (10.5 per cent), gas consumption declining by 1.1 per year, renewables (i.e., hydel and nuclear) growing at 8.9 per cent, coal at 8.2 per cent, and biomass fuels at 4.5 per cent per year. The result of this scenario, in the absence of other countervailing policies, is a sustained increase in emissions and ambient concentration of air pollutants. Sulfur dioxide emissions are projected to grow at 10.9 per cent per year, oxides of nitrogen at 7.4 per cent, and particulate matter, carbon monoxide, and volatile oxygen compounds between 4 and 5 per cent a year.

These scenarios are predicated on the continuation of existing pricing policies. However, such policies have a number of problems. Essentially, the price signals encourage use of dirty fuels, provide incentives for adulteration, and are insensitive to resource constraints. (Box 9.1)

The key pollutants, SO₂, NO_x and CO and are emitted by dirty fuels—furnace oil, gasoline, diesel and poor quality local coal. The emissions, however, depend not only on the fuel mix but also on fuel quality and emission regulation. Currently, the fuel quality in Pakistan is supposed to be very low. According to a report of the Clean Fuels task force of the Pakistan Environment Protection Council, furnace oil has a sulfur content of over 3 percent, and diesel over 1 per cent, in contrast to international standards, which have come down to 1 per cent and 0.05 per cent respectively. Similarly, Pakistan continues to use leaded gasoline, with consequent lead pollution. Changes in fuel quality are possible but require the collaboration of the ministry of petroleum and natural resources, which has a monopoly over fuel imports.

Finally, the emissions levels depend on pollution abatement technologies used by the institutions. These would depend on the regulatory regime, as well as the monitoring and implementation arrangements. Currently, while overall national environmental quality standards have been established, industry specific standards for the energy industry have not been developed. This again would require an active collaboration between the PEPA and NEPRA.

Similar measures and regulations are required to address the other main source of air pollution, namely motor vehicle emissions. Older laws, such as the Motor Vehicle Ordinance (1965) and the Motor Vehicles Act (1969), are somewhat vague, and not complied with, even in the most rudimentary way, due to lack of resources, non-transparent institutions, and lax enforcement. The NCS reports that the average vehicle in Pakistan is over 15 years old, it emits 20 times more hydrocarbons, 25 times more carbon monoxide and 3.6 times more nitrous oxides than the average vehicle in the US.

9.6 Renewable Technologies

Hydel power as an alternative energy source is likely to reduce overall emissions, but at the cost of considerable ecological damage. There is a real concern that any further large dam construction on the river Indus could trigger

irreversible degradation of its already fragile ecosystem. A generic question is whether there are sufficient inflows in the river system to warrant construction of an additional dam (Khan: 1999).

Besides hydel power, there is no significant effort to induce a switch to renewable technologies for energy production. These have acquired special significance in view of the concerns over global climate change. Several financing sources make it possible that these technologies can be acquired on concessional terms. The sources include the global environmental facility (GEF), the World Bank's prototype carbon fund (PCF), and the somewhat tentative clean development mechanism (CDM) agreed to during climate negotiations. However, there is no effort to pursue such resources aggressively.

9.7 Energy Conservation and Efficiency

Another area of concern is energy conservation and efficiency. *Energy intensity*, defined as final energy consumption per unit GDP, is a measure of use efficiency, and is the object of policy interventions. Energy use *inefficiency* is associated with the continued use of old and obsolescent boilers and furnaces in the power and industry sectors, poorly maintained diesel and petrol vehicles, high transmission and distribution losses, energy inefficient wood stoves used by households, and generalized inefficient use of energy. On the demand side, energy profligacy stems largely from the lack of conservation efforts. Clearly there is scope for increasing fuel use efficiency and reducing emission levels through a variety of policy initiatives. These include technical measures such as equipment updates and energy efficient devices, management innovations on the factory floor and price adjustments which both encourage fuel conservation and induce switching towards less polluting fuels. Essentially, technical and management interventions lead to downward shifts in emission levels while price measures can also dampen emission trends.

In the industrial sector environment specific policies aim at addressing market failure. The norm has been to rely on

command and control policies, which are enforced weakly because of deficient implementation capabilities. Recent attempts are being made to replace these with voluntary, market-based pollution charges (see chapter on urban and industrial pollution). The consultations between the government, NGOs and industry in determining these charges bodes well for implementation and also reflects the failure of the government's traditional enforcement approach. In addition, the emissions problem is also an outcome of bad zoning – where proximity to urban residential areas, combined with urban pollution from mobile sources, leads to high emission concentrations.

9.8 Recommendations

The basis for optimism in the energy sector is provided by the emergence of new regulatory institutions, which are not necessarily plagued by a conflict of interest between implementation concerns and regulation. There is a strong possibility of establishing a collaborative arrangement between NEPRA, PEPA and key environmental NGOs. The partnership could adopt a plan of action with the following plank:

- **Conservation:** A combination of regulation, technical assistance, identification of grant sources, and a set of price incentives for power producers, home-builders, industry managers, and vehicle owners to improve energy conservation.
- **Renewables:** A combination of research, technical assistance, identification of financial resources, and pricing and regulatory incentives to encourage a switch to renewables over time.
- **Emission regulations:** Along the lines of the NEQS, but with specific application to the energy generation sector, to be developed through a stakeholder roundtable process, as used effectively in the development of a policy framework for industrial pollution abatement.

- **Fuel quality:** A combination of inspection, open import policy, and pricing incentives for a switch to cleaner and better quality fuels.
- **Energy security:** A program of community development, participatory research, and rights protection to ensure adequate access to energy for the poor.

Chapter 10

Trade

One of the most significant factors that will determine the prospects for sustainable development in the future is the process of globalization and trade liberalization. While there is continued opposition to this process, as witnessed recently at Seattle and Davos, often by people by starkly opposite agendas, there is a tone of inevitability to some of its central tendencies. Most importantly, in the minds of many public officials and business leaders, the future prospects of economic growth and productivity increases have become derivative of trade expansion. On the other hand, while some of the effects of this process could translate into improvements in human development and reduction in poverty, that is neither necessary nor sufficient.

This provides both an opportunity and a challenge for the environmental agenda in the country. On the one hand, it provides a basis for harmonizing growth and conservation goals. The environmental agenda can help ensure that the export potential of the country—including its access to international markets, and the prospects for sustained productivity growth—are not hindered by a weakness of capacity, expertise, or legal/ institutional framework. On the other hand, many proposals of industrialized countries on environmental issues are inimical to the prospects for both productivity growth and environmental conservation in the South. A major threat in this regard is the fear of new forms of conditionalities and restrictions imposed by industrialized countries on environmental and social grounds. While these restrictions are being opposed by developing countries in international forums, anticipatory changes have already begun to emerge in the most dynamic export industries. The South

has to ensure that the policy trajectories that are chosen both domestically and in global negotiations are optimal along all of the above dimensions.

In other words, there is also a need to ensure that the trade agenda does not overtake the entire policy agenda, and thus further marginalizes the other major socio-economic agendas—human development and poverty eradication. Economic growth, which is now seen by many to require trade liberalization, is only one of the three mainstream socio-economic agendas in Pakistan even if it has consistently attracted the bulk of the attention of leading policy makers. The needs of the other societal agendas are independent of and even opposed to the trends in trade liberalization.

10.1 Trade and the Environment

Trade liberalization affects the environment in five different ways. However, the net costs and benefits of the impacts depend critically on the domestic policy choices.

- **Scale Effects:** Trade induced demand for goods and services can place pressure on the environment, especially if the demand is for resource intensive goods (forest products, pollution intensive agricultural product). In this sense, trade acts as a magnifier and exacerbates existing environmental problems and threats to the commons (deforestation, air and water pollution, and land degradation).
- **Transport Flows:** Trade intensification requires additional infrastructure, such as roads, railways, harbors, and storage facilities, all of which tend to have adverse environmental impacts.
- **Resource Effects:** If trade expansion leads to economic growth and prosperity, it can help generate resources and awareness to address environmental problems.
- **Product and Technology Effects:** Trade liberalization can lead to two types of technology flows. On the one hand, there are fears that environmental policies in industrialized countries will lead to the “dumping” of dirty products and

dirty technology in developing countries. On the other hand, trade liberalization can provide access to clean technology. However, there is a caveat here as well, and technological innovation may result in the depletion of natural resources.

- **Structural Effects:** Trade can promote a shift towards primary production in countries whose comparative advantage lies in their natural resource endowment. While in principle, this can induce investment to shift out of polluting industry, in practice it depends on whether the investors view lax environmental standards as a source of comparative advantage.

Most of the adverse outcomes can be pre-empted by complementary domestic policies, which strengthen local property rights (both individual and collective), price resources at their true market value, and internalize environmental costs.

The crux of the issue is that social and environmental objectives can be achieved more effectively and equitably through domestic policy interventions, rather than through attempts to harmonize environmental standards internationally. A practical discussion of this issue in the context of key Pakistani exports is presented in Box 10.1. Two product groups, cotton textiles and leather are selected both in view of their economic importance and potential pollution impacts. The textile industry is the largest in terms of exports, value added and employment. Leather is the fourth largest, but is considered to be the most polluting industry. The analysis abstracts from the benefit enhancing effects of freeing trade in these product groups and focuses instead on the adverse environmental impacts, the costs of mitigating them and the policy and governance imperatives.

Box 10.1

Case Studies on Trade and Sustainable Development

Pakistan: Environmental Impact of Cotton Production and Trade (Banuri: 1999)

Environmental Impacts and Mitigation Costs Associated with Cloth and Leather Exports in Pakistan (Khan, et al: 1999)

Environmental Impacts Cotton Production

The study details the adverse environmental impacts of the cotton commodity chain. It begins at the cotton production stage, which utilizes the bulk of the pesticide consumption in the country. The health hazards are both direct and indirect. Direct effects result from drifting pesticide sprays, leaky applicators and exposure during cotton harvesting (women are the most vulnerable as they do the bulk of the picking) and improper use of pesticide containers for other purposes. Indirect effects emanate from seepage and runoff, through ingestion of contaminated water and bio-magnification of toxicity in the food chain. Inadequate or illegal disposal of expired or unused pesticides is another contributing factor.

Adverse environmental impacts include reductions in soil fertility, water retention capacity of the soil, and drought tolerance of crops. Also, pesticides indiscriminately kill useful insects, micro-organisms and insect predator species and lead often to the emergence of more virulent and resistant species of insects and vectors. Pakistan has experienced the so-called pesticides treadmill where pesticide use increases in inverse proportion to its effectiveness. Fertilizer run-off results in eutrophication, which harms fish stocks, and soil erosion and pan formation.

Textile and Clothing Production

Although some health effects are caused by ambient air pollution at the spinning or weaving stages (respiratory problems arising from inhalation of cotton dust in primarily small scale units), the most significant impacts are associated with the processing stage. This can cause water pollution because of the discharge of untreated liquid effluents (mostly from washing operations) into waterways and the ocean. These effluents lower the dissolved oxygen of the receiving waters and reduce light penetration, thereby threatening aquatic life and plant production. In addition TDS, organic salts dissolved in water accelerate corrosion of water systems and depress crop yields if used for irrigation.

Metals, such as phenol and chromium used in textile processing are known to be carcinogenic. Chlorine odor and chromium can result in liver and digestive system disorders. Azo dyes are believed to be carcinogenic and allergy inducing.;

Leather Production

Leather tanning is ranked as one of the most polluting industries compared to other manufacturing industries. It has also the highest toxic intensity per unit and utilizes roughly 130 different chemicals. Most of the pollution results from solid and liquid wastes. Direct exposure to chromium residues contained in solid wastes causes cancer and lung perforations; indirectly, chromium is transmitted into the food chain via recycling of wastes to poultry feed manufacturers. Roughly, 100 liters of water are used per kilogram of converted leather. The untreated discharges contain high concentrations of toxic metallic compounds, biologically oxidizable materials and large quantities of putrefying suspended matter, contaminating both surface as well as sub-surface water. Studies have revealed high levels of pollution in water bodies across Sind, Punjab and the NWFP with associated contamination of prime agricultural land, reduced crop yields and animal mortality. Air emissions of ammonia, flue gas and leather dust are also a source of respiratory diseases, cancers and allergies.

Cost Benefit Analysis

Mitigation measures – both in plant and external – can eliminate up to 91 per cent of the emissions from textile industry, and 66 per cent from tanning. The costs of such measures are extremely low – amounting to 0.11% of GNP in 1996-97, while the foreign exchange liability is equal to 1.6% of total cloth exports in the same year. The mitigation cost at the plant level would be 1.6% of sales revenue.

Elements of A Future Strategy

Trade and Industrial Policy

Maintain regulatory duty on pesticide imports, coupled with a re-induction of the 1971 Pesticides Ordinance to ensure adherence to worldwide restrictions on banned products. Reflecting the internalization of environmental impacts, allocate accrued duties for R&D on environment friendly products (organic) and practices (IPM, ICM etc.). Offset protection to domestic producers (packaging firms) by an equivalent excise duty with the accrued amounts again being allocated for environmental research. Clearly, the rationale for a packaging subsidy does not exist. Also, trade

liberalization has an in-built propensity to do away with plant and machinery obsolescence, and inefficient management engendered by years of protective policies.

Technical Interventions: Mitigation

Reduce volume and concentration of pollutant loads by a combination of internal in-plant control measures well as external end-of-pipe treatment. In-plant economies can be achieved through substitutions, reduction of chemicals, water reduction and recycling. External effluent treatment consists of chemical or primary (screening, neutralization and sedimentation) and biological or secondary processes (sludge treatment). Introduce chemical-free textile processing (natural dyes)

Research

Undertake genetic research to breed insect resistant varieties. Popularize integrated pest management (IPM), building on traditional farmers' practices (altering time of sowing and harvest, hoeing, removing crop residues, crop rotation, intercropping hand picking, use of pheromones, and using botanical pesticides such as neem and tobacco extracts). Also, pursue closely related alternatives such as integrated crop management (ICM) and organic agriculture.

Institutional Initiatives

Enhance institutional capacity to provide timely information on global environmental regulations to domestic industry. Specifically, improve coordination between the Ministry of Environment, the Commerce Ministry and environmental organizations such as the WWF and IUCN. Strengthen partnerships between NGOs, private sector and government with a view to formulating and implementing national environmental quality control standards (NEQS), under innovative voluntary arrangements. The key aspects are financial incentives for pollution abatement, the imposition of a pollution charge on effluents that does not meet quality standards, and the initiation of a proper system for monitoring and assessment. The PEP partnership provides another example of potential synergies between NGOs, donors and the government with a view to formulating and leveraging environmental policy reform.

The Governance Implications

While sustainable alternatives both in cotton production and cotton textile

and leather processing are relatively easy to identify, implementing these options goes considerably beyond mastery of the technologies. Also, the economic costs of transition are low as farmers costs and costs of cloth production constitute only a small proportion of the final price, with the bulk of the rents being captured by Northern retailers. However, despite its evident viability, the transition to sustainable development practices requires fundamental changes in the structure of management and governance systems.

At the production level, the first order of priority is for the government to reassess its priorities away from traditional yield enhancement goals in favor of long-term sustainable production objectives and to distance itself from diverse vested interests, such as the pesticide lobbies. From a farmer's perspective, uncertainty of crop yields as a result of adopting new technology means taking risks. He is also unaware of and lacks access to green markets. The transition to IPM in a central manner will require awakening the interest of the research establishment. This means establishing career paths, research and training opportunities, international exposure and even commercial opportunities for researchers. Clear incentives will have to be provided to extension officials and university faculties to switch to IPM based education and practice. The transition must also involve pesticide companies. Finally, there is a need to establish crop insurance programs to reduce the farmers' risk during the transition and to expose him to green marketing outlets

The governmental machinery pertaining to the industrial sector is neither as sophisticated nor as complex as that for the agricultural sector. While there is a national system of industrial research institutions (PCSIIR) it is neither as goal driven nor as well integrated into the agricultural system as PARC/NARC. Second, there is no integrated system for determining industrial policy when it comes to environmental considerations. Third, the system of industrial education (both engineering and business schools) are more or less completely divorced from the research and policy institutions. Finally, the clout of the environmental agencies is far from adequate given the task. The positive aspect is that in the absence of a recognized system of industrial governance there exists space for policy innovations such as the SDPI-TTSID initiative in the textile processing sector. In the garments and apparel production segment, where market conditions are determined by a small number of international retail chains, the issue is an incremental one, such as in the case of azo dyes, and where the impetus for change comes from foreign firms.

However, the main points are quite clear. Domestic choices often reflect differences in institutional capacities for the design, implementation, and monitoring of decisions, as well as in natural resource endowment, assimilative capacity, and social and cultural tolerance of pollution. In contrast, trade restrictions—be they contingent protection (e.g., countervailing or antidumping duty), competitive subsidization, or the harmonization of pollution standards—abstract from such differences. However, stronger grounds exist for imposing trade restrictions on commodities with embodied environmental impacts—especially when equivalent domestic restrictions are in force.⁴¹

In general, however, trade restrictions are not the best way of offsetting differences in costs arising from differences in environmental standards because they do not address the root cause of the problem. Heerink et al (1996: 131), cite an argument made by Bhagwati (1979) to argue that “The optimal instrument for a problem is the one among the list of feasible instruments whose base is most closely related to the source of market failure.”

On balance, a case can be made for harmonizing the *form* of environmental policy (principles and measures) rather than standards per se. The polluter pays principle is a good guiding principle in this regard. However, in the absence of a supranational enforcement authority to ensure cross-country implementation – as in the case of trade measures, environment specific policy formulation at the national level requires a degree of trust and mutual cooperation. This may not be easily forthcoming.

The preference of industrialized country negotiators for trade restrictions over domestic policies may reflect the absence of such trust. It is probably also motivated by fears of industrial relocation to non-regulating developing countries. The evidence, however, does not support this; cleanup costs tend to be much lower than relocation costs, as reflected in labor availability and quality,

41 For instance pesticides with harmful health effects and/or with enduring toxicity that can pollute water, degrade soil or biomagnify up the food chain.

wage rates, supporting infrastructure, tax incentives, market size, transport costs and country risks.

10.2 Trade liberalization in Pakistan

Pakistan began liberalizing its trade and exchange rate regime since the late 1980s. This process is driven primarily by various structural adjustment and stabilization programs, and has preceded the recent multilateral trade negotiations. Indeed, the tariff bindings agreed under the trade agreements are very high compared with those accepted under the structural adjustment programs. Taken together, these agreements have resulted in a lowering of the maximum tariff rate—including such supra-tariffs as import fee, *iqra* (education) surcharge, and the flood relief fund—from 225 per cent in 1988 to 35 per cent in 1998, cascading of tariff rates, narrowing of tariff dispersion, removal of exemptions through statutory regulatory orders, and substantive reductions in quantitative restrictions provided hitherto through import licensing and negative lists. This also affected the agriculture sector, which constitutes the bulk of Pakistan's export potential. In 1988, the simple average tariff on agricultural commodities was 55 per cent, with half the tariff lines subject to the 80 per cent maximum for agricultural imports. By 1994, this rate had been lowered to 49 per cent.⁴²

In addition, exchange rate management was rationalized, current account convertibility introduced, exchange rates unified, capital account transactions liberalized (mainly through permission for repatriation of profits, and the holding of foreign currency).

However, by international standards, Pakistan is still a relatively protected economy with broad discretionary powers enjoyed by the administration. The trade regime is still selectively restrictive and contains quantitative restrictions and optional

42 Tariffs on textiles and clothing are slated to come down by 8.9 per cent and on agricultural products by 5.1 per cent.

exemptions on raw material imports.⁴³ More significantly, exchange controls resurfaced during the 1998 national emergency.

10.3 Policy Options

The policy community around trade issues comprises the main economic ministries and interest groups, with the special involvement of exporters and the Export Promotion Bureau. In practice, the lead on international trade negotiations is in the hands of the Foreign Ministry, which has developed considerable expertise in the subject through prolonged exposure to it. The Ministry of Environment, and the environment policy community in general are not represented adequately in such discussions.

In this regard, the role of the environment policy community needs to be to sustain the trend toward pollution control, natural resource conservation, and sustainable industrial development. This can assist in preparing the ground for the country to take advantages of emerging opportunities. It can also attract financial and technological resources for assisting industrial groups to adopt improved standards of environmental performance.

Second, environmental groups can ensure that social and environmental assessment of trade policies be undertaken, not as an ex-post evaluation, but as a dynamic and on-going process initiated early in the policy cycle. It should begin at a pre-negotiation stage, continue during the negotiations and after they are concluded. The general purpose of the environmental review is to inform policy makers, NGOs and other key players in advance of the consequences of trade liberalization measures and agreements. Besides the direct impact on natural resources and the environment, such assessment should also examine factors that affect the environment indirectly. In Pakistan, these factors should include the impact on poverty, communities, and institutions.

Such assessment should promote win-win strategies and eliminate, or at least mitigate, negative environmental and social

43 A category of exports is still subject to special procedures, such as fertilizer exports, which have to meet local availability criteria. Quality control restrictions apply to private sector exports of rice, cotton, meat, fruit, vegetables and oilseeds.

impacts of trade expansion, either through complementary environmental mechanisms or through the modification of the provisions of the trade agreement. It should take the form of a transparent, open and public debate at different stages and levels of the negotiation process. Environmental groups are in the best position to lead such assessment exercises, given their contribution to participatory and stakeholder-led processes of decision making.

The assessment exercise must be based on empirical analysis, including case studies, model scenarios and evaluation techniques; transparent decision making; diffusion and exchange of information; and inclusion of different stake-holders, including government officials, international and regional institutions, NGOs, business groups, and international interests;

Part IV

Mainstreaming the Environment A Millennial Strategy

In the chapters that follow, we try to pull together the main ingredients of the policy package proposed here.

It is useful to recognize the existence of at least three major programmatic initiatives in Pakistan.

- The first is what could be called the overall program of **economic development**. The operative indicators of performance for this program are the growth rate of income and exports. Some writers have referred to this as the "core" policy agenda. Its focus is the industrial sector--including large-scale manufacturing and energy production. This sector is well articulated with the global economy, uses modern equipment, management systems, and organizational forms. The policy framework for this sector aims to modernize it, attract domestic and foreign investment, and encourage exports. The environmental problems in this sector have to do mainly with industrial emissions--although it includes energy conservation as well.
- The second ongoing initiative is that on **poverty eradication**. The operative indicator of performance of this program is the level and nature of poverty. The energy and initiative for this program have come largely from the non-governmental sector (e.g., OPP, AKRSP, NRSP, Sungi) albeit with the support of various government ministries and departments. This is relevant to the environment program because the bulk of the natural resources are located in rural areas where poverty is entrenched. Indeed, various environmental initiatives addressed to natural resource issues have adopted the community development philosophy fully. The NCS, which was focused mainly on natural resource conservation, also displayed a firm commitment to this philosophy. Such

programs include various recent initiatives in protected areas management, social forestry programs, and participatory water management programs.

- A third initiative could be termed as human development, basic needs, or the **quality of life**. The operative parameters here are mortality, morbidity, literacy, and security. As a result, the programs have tended to focus on health and education, mainly correctional and curative rather than preventive. However, it has also been linked to some programs of urban development. Mainly critics of the mainstream model of industrial development champion it, although it includes amongst its supporters some multilateral agencies--especially UNICEF, UNDP, WHO, and some divisions at the World Bank. It has involved the need to work closely with the informal sector, and with municipal and local governments.

Each of the above programs has broad policy constituencies within and outside the government, distinct disciplinary and experiential structures, and different definitions of success and failure. These are established programs in the policy arena, and new programs need both to understand the way of thinking that exists in these, as well ways of influencing those who determine the course of the programs. While there are other distinct policies as well (e.g. forestry sector master plan, water sector investment strategy, energy policy, agriculture policy, educational policy, health policy etc), most of those can be grouped under one or the other heading above.

There are five broad conceptions behind this proposal.

- First, that the goal of environmental strategy in this phase must be the mainstreaming of conservation into traditional policy making areas. We have identified three broad areas of policy making: economic growth (or export led industrialization); quality of life and human development; and poverty eradication and sustainable livelihoods.
- Second, that the economy is better viewed as the intersection of three very different spheres: the rapidly globalizing, corporate economy, built around exports,

technical progress, and large scale investments; the human scale local economy, built around nontradable goods and services, which supports and sustains the corporate economy; and the increasingly marginalized and vulnerable livelihood economy of the poor in urban and rural areas. These correspond to the three social programs listed above. Environmental policies must cater to all three economies in order to be sustainable.

- Third, that around each economy, and indeed each sector of the economy, there is a “policy community”, which brings a framework of analysis, and an approach to intervention for the issues. The environmental strategy must be able to interact with each of these communities on their terms, and to assist them in designing more sustainable programs and policies. Included in the concept of the policy community is that of the key implementation agency, which ought to be the target of action. In the corporate economy, the target is the domestic and foreign corporate sector; in the local economy, it is the informal sector and the municipal agencies; and in the livelihood economy, it is the community organizations and their support group. The environmental program must be able to work through the appropriate agencies, rather than rely on entirely new or distinct institutions.
- Fourth, accordingly, the Ministry of Environment has to play three distinct roles. Its **regulatory** role in the industrial sector has to be backed up by its character as a **technical assistance agency** for the corporate economy, providing it with information on clean technologies, sources of funding and assistance, and access to markets for environmental friendly products. In regard to the livelihood economy, it has to play the role of a **support agency** for community development efforts, in order to empower and mobilize local communities to protect their natural resource base. Finally, in the local economy, it has to play the role of the country’s leading **public health agency**, undertaking research on the links between environmental degradation and disease, and building a

string constituency around the protection of human health. These three roles are described in somewhat more detail in the three chapters that follow.

- Fifth, that the three programs have to be accompanied by effective monitoring of the results through sustained data collection exercises. These data should be incorporated into three distinct “output oriented” indicators of sustainable growth, sustainable livelihoods, and quality of life. In addition, there should be an indicator of the capacity of institutions.

In all of these cases, it is recommended that the earlier focus on institutional development and capacity building must be maintained. This implies continued working through stakeholder groups, roundtables, and networks. It also means an active reliance on institutions that have the expertise and legitimacy in such actions. Just as the building of a dam or a bridge requires professional training and experience, and cannot be communicated through a two-week training course, the building of communities also requires extended knowledge and experience. If this knowledge is treated with the same deference as is accorded to other professional skills, the environmental program will be able to reap much larger benefits.

Behind this proposal is the concept that a strategy requires mobilizing support and identifying key actions that can lead to a self-sustained process of change. It also requires the capturing of the high ground in policy discussions. For this, it is imperative that environmental actions are seen as supportive of a larger societal agenda. While the links with the poverty eradication and quality of life agendas are quite self-evident, they still have to be communicated effectively. The links to the growth agenda are somewhat less intuitive. However, as has been argued in the following pages, the emphasis on the growth agenda has to be kept on export promotion, and support to productive enterprises for effective participation in the global economy. Such participation can come only on the basis of clear and visible environmental management at the enterprise as well as the national level.

For example, unfettered industrialization will lead to increasing pollution. Similarly, unless actions are taken to protect natural resources in rural areas, poverty eradication will not produce sustainable results in the long run. Finally, there is a traditional agenda of the improvement of the quality of life, whose goals are closely linked to the environmental program. This synergy can be developed further.

Chapter 11

Sustainable Industrial Development

The title sustainable industrial development may appear to be an oxymoron. However, its purpose is to show that unless safeguards accompany the growth and industrialization process, it will reverse itself within a short span of time. As mentioned, the prevailing body of opinion is that growth and environmental conservation are not necessarily mutually supportive. However, this is an erroneous view, and is based on a "static" conceptualization of the development process.

11.1 Sustainable Growth

There is considerable controversy on the relationship between economic growth and the environment. An early, "wilderness conservation" view held growth to be invariably destructive of the environment (through air and water pollution and resource depletion and degradation). Under this wilderness perspective—which may have motivated the best known among the early environmental organizations, including IUCN, WWF, the Sierra Club—the proposed solution was, as one of the founders of IUCN phrased it, "building a new Ark", namely isolating and protecting designated areas and species.⁴⁴ This approach has often been criticized as quintessentially 'Northern' in orientation, and inconsistent with and even

⁴⁴ There were significant differences, however, between various protagonists of this perspective, ranging from aristocrats who sought to protect nature for its intrinsic value, and middle class defenders of the leisure value of nature and natural resources.

insensitive to the values and practices of other parts of the world.⁴⁵

Subsequently, however, as the reach and impact of the industrial process began to be appreciated, other concerns appeared, including those pertaining to the persistence of chemical pollutants (Carson 1963), depletion of non-renewable resources (Club of Rome 1972), and hazardous and extreme events. In these perspectives too, economic development was perceived to be irredeemably harmful for the environment, but they advocated not the protection of isolated regions or species, but a fundamental change in behavior and values, and especially a slowdown or reversal in the rate of economic and demographic change. It has been associated with aggressive global advocacy organizations—Greenpeace, Earth First!, Urgewald, and others.

An alternative approach lies behind what Guha (1989) calls the poor peoples' conservation movements, the example chosen by him being the famous *Chipko* movement in India. Here, the causality runs in the opposite direction, whereby environmental degradation is seen as inimical to the prospects of socio-economic progress and poverty eradication. At the heart of this approach is a political conception of environmental degradation, stemming from the unequal distribution of political and communicative power. As a result, the advocated solution is primarily in terms of empowerment and collective action.

Other recent approaches have been relatively equivocal about the relationship between economic growth and the environment. The concept of sustainable development, introduced by IUCN, WWF, and UNEP in the *World Conservation Strategy* (IUCN et al 1980), sought to harmonize the two objectives through the choice of appropriate policies and instruments, and provided the intellectual foundation for a variety of global and national initiatives. While most of these have tended to fall in the category of technocratic and

45 As Martin Holdgate (1999) remarks: " today's 'conservation movement' is, in a sense, counter-cultural because it argues that ... nature needs protection *against* human society.... [B]y treating people and nature as if they were separate, and by seeming at times to place wild creatures above humans, this 'Northern' protectionist thinking stepped out of line with the values of many parts of the world." (Holdgate 1999: 1).

managerial solutions to environmental problems, a distinct strand has built upon the legacy of the *Chipko* approach to support empowerment programs.

A recent idea that needs to be mentioned in this regard is that of the Environment Kuznets Curve (EKC), which suggests that economic growth leads initially to an increase in environmental degradation followed by a decline. The basis for this idea was a set of environmental studies, some of which in retrospect are believed to be of questionable quality, which examined the relationship between per capita income and selected environmental variables in a cross section of industrialized and developing countries. While the empirical results supported the hypothesis only in the case of one or two air pollution indicators, analysts and multilateral financial institutions (including the World Bank, ADB, and others) seized upon them with alacrity to suggest that economic growth was the best means of overcoming environmental degradation. As mentioned, subsequent studies have failed to validate the hypothesis except for a few air pollutants. As a result, the focus of attention has reverted to the policy and institutional determinants of sustainable development.

The controversy surrounding the Environmental Kuznets Curve (EKC) hypothesis may stem partly from inconsistent interpretations of growth. Perceived policy neutrality with regard to environmental outcomes appears to be a fall-out of growth being defined narrowly as an increase in per capita income. The causality is from policies to growth which, in turn, is deterministically linked with levels of degradation and pollution. Over time, this restricted view of growth has been subsumed under the more broad-based notion of sustainable development, as defined by its three key elements namely, efficiency, equity and environmental sustainability (Munasinghe: 1999). When growth is viewed in this fashion direct links between policy and environmental outcomes can be envisaged. Implicit in this is a proactive role for stakeholders – policy makers, the private sector, donors and communities as stewards of the environment.

However, recent research shows very clearly first, that evidence in support of the EKC is quite weak, and restricted to a small number of air pollution variables; and second, that there is no inevitability even to the patterns that are supported by the evidence. Indeed, detailed research on the greening of industry in a number of countries

(China, Bangladesh, Brazil, Philippines, and Indonesia) shows that environmental policies are already bringing down pollution levels and saving lives (World Bank n.d.). This research also shows that in view of the weakness of monitoring and regulatory institutions, these countries have adopted a variety of participatory approaches to improve the quality of air and water. These approaches include voluntary labeling schemes, participatory policy development, such market-based instruments as (presumptive) pollution charges, and programs of community building and awareness (ibid). Pakistan has been the pioneer of such approaches--although, unlike the countries mentioned in the World Bank study, this has been a home-grown approach rather than led by multilateral or bilateral institutions.

To summarize, we can identify five alternative approaches regarding the relationship between economic development and the environment:

- A **protectionist** view, in which development is invariably bad for the environment, and needs either to be compensated through protectionist policies, or reversed through anti-development policies.
- The **EKC (or laissez faire)** view, under which development leads eventually to an improvement in environmental degradation, albeit after an initial period of degradation.
- A **sustainable development** view, in which an appropriate choice of policies can help harmonize the goals of economic development and environmental conservation.
- An **institutional** view, in which environmental degradation is seen as being caused by institutional and political weaknesses, and the solutions in terms of institutional development and empowerment.

By and large, developing countries have adopted some combination of the last two of these perspectives.

- As key elements in the overall growth process, industrial and urban growth are a source of air and water pollution. The absence of policies to account for such pollution externalities tends to exacerbate the problem, although growth-embodied technological effects may be benign.

- To the extent that the growth process is inequitable and marginalizes rural and urban communities it encourages resource mining (deforestation, rangeland degradation, desertification). Unbalanced growth is reflected in a neglect of the social sectors (health, education, infrastructure for the poor), as well as a failure to take traditional practices into account or establish clearly defined property rights. The resulting downward spiral of poverty and environmental degradation is commonly referred to as the poverty-environment nexus
- Growth accompanied by inefficiency is another source of pollution. Inefficiency is generated by pricing distortions at the macro and sector level which give rise to perverse incentives and, hence, encourage profligate use of resources. This, again, reflects a policy failure.
- Last, but not least, there is a direct correlation between the fiscal and financial outlays and policy, program and institutional effectiveness in mitigating environmental impacts.

11.2 Recommendations

Much research has shown that the growth process responds to the policy environment, economic and political stability, and clarity of property rights, more than it does to direct subsidies or direct costs. The growth process in countries like Pakistan has been harmed not by the high costs of production or the absence of subsidies to industrialization—quite the contrary—but by policy instability and unpredictability. This instability has been produced not only by political instability, but also by the centralized and ad hoc nature of policy making, as well as the extent of corruption.

We are also in a world where future growth prospects will be tied very strongly to the ability of a country's entrepreneurs to take advantage of emerging global opportunities. While it is the task of international negotiators to ensure that Pakistan's national interests are not undermined by such processes, it is important to remember that in the long run, benefits will accrue primarily to those who learn how to take advantage of emerging global opportunities, and how to avoid incurring unanticipated costs from global sources.

The environmental agenda is not only consistent with the above goals, it is positively essential if the goals are to be realized. For this purpose, however, the Ministry of environment needs to adopt a technical assistance role, in which they would advise local entrepreneurs about emerging global opportunities and challenges, funding opportunities, sources of and means of access to clean technologies, and in particular the need to improve systems of management for environmental purposes. For purposes of the above discussion, the role would be broadly similar in relation to energy projects, as well as to the introduction of sustainable agricultural practices.

A second role that could be played by the environment Ministry in this regard is to support the creation of a stable policy environment. Such an environment would give clear signals to entrepreneurs, and induce them to undertake investment in areas with growing markets.

These two roles, combined with the public health role--which is primarily regulatory in nature--and the social mobilization role, which is protective of the interests of the poor and vulnerable communities, would synthesize into a meaningful, effective, and influential environmental strategy.

Chapter 12

Sustainable Livelihoods

In this chapter, we examine the third strand of the agenda proposed here, namely the joint pursuit of poverty eradication and natural resource conservation. Poverty eradication has been an important plank of economic policy making in Pakistan since the late 1960s. This emphasis is in keeping with the high and persistent degree of poverty in the country (and in the South Asia region in general).

12.1 Poverty and Environment

According to Hussain (1994), who defines poverty in terms of a caloric intake of 2,250 calories per day, the number of poor in Pakistan are estimated at 29.86 million, of which 20 million are in the rural areas, and 9.86 million in urban areas. Hussain goes on to argue that while the incidence of poverty in the country had declined between 1970 and 1988, there were indications that it had risen since then. He also attributes the persistence of poverty to the structure of the economy.

As we have seen already, there are complex inter-linkages between poverty and the environment. The most obvious of such linkages is through the problematic of energy security, whereby the lack of access to modern energy sources forces the poor to rely largely on fuel wood collection to meet their energy needs. This puts pressure on the forestry resources of the country. However, the continuous degradation of forests and rangelands, and the absence of any coherent strategy for energy security will mean that the livelihoods of the poor will be greatly endangered in the future.

Other linkages between poverty and environmental degradation arise from the inability of the poor to defend

themselves against the effect of pollution on their health, their lack of access to health services, clean water, or sewerage services, and poor knowledge of health-related matters. Finally, as we have noted already, the bulk of poverty lies in rural areas, which depend on natural resources not only for the energy needs but also as a basis of earning livelihoods. The degradation of the environment affects all of these dimensions directly.

Finally, as common as well privately held resources have come under pressure, and doubts have surfaced regarding the capacity of state-owned or state-managed institutions to protect such resources or defend the rights of titular owners, a basic policy response has been to privatize them and change the structure and protection of property rights fairly rapidly. This is most apparent in such cases as forestry and irrigation water. This view is based on a peculiar conception of poverty as well as governance, a conception, it may be added, which is both highly misleading and highly dangerous.

This suggests that the problem is not that of combining two programs with different objectives. Rather, the problem is one of finding a single solution to both programs. Below, we use some recent theoretical literature, together with the ground experience in Pakistan to argue that such a programs requires reliance on the insights provided by community development approaches, not only for poverty eradication but also for resource conservation.

Below, we look at the inter-relation between poverty and environmental degradation. As mentioned earlier, our approach is distinct from the conventional treatment that relies on the EKC hypothesis, which sees environmental degradation first increasing and then decreasing with economic prosperity. In contrast, the alternative presented here views the simultaneous pursuit of economic prosperity, poverty eradication, and environmental conservation to be not only possible but also necessary. In this approach, the major emphasis of policy is on the creation and strengthening of institutions that can make such a pursuit possible. Second, and more importantly, it builds on some of the most innovative recent work on poverty eradication to advocate a concentration on the building of social capital. Finally, behind this approach is an alternative perception of poverty. This perception

places central emphasis on uncertainty, vulnerability and shocks, as well as the coping and adaptive strategies of the poor. Indeed, this approach provides an insight both into the role played by the environment in the lives of the poor, and on the nature of threat posed by environmental degradation.

The relevance of this idea to the current discussion is that the bulk of the natural resources of the country are in areas that are largely inhabited by the poor. The economy upon which the poor subsist is largely dis-articulated from the larger global economy. Normal economic instruments often produce unanticipated and perverse results upon the poor. Finally, there is now a large body of knowledge that has sought to eradicate poverty through social mobilization and community development. This approach has already been applied to the management of selected natural resources—forests, irrigation water, and protected areas.

12.2 Sustainable Livelihoods

The joint pursuit of economic growth, environmental conservation, poverty eradication, and participatory development has been termed sustainable human development (SHD). A useful definition of SHD is ‘the enlargement of people’s choices and capabilities through the formation of social capital so as to meet as equitably as possible the needs of the current generation without compromising the needs of future ones’ (see Banuri *et al* 1994). An innovative approach that is being offered as a mechanism for operationalizing and implementing SHD is that of Sustainable Livelihoods (SL). Both are dynamic rather than static concepts, in that they focus not only on outcomes but also and more centrally on capacities and processes through which such outcomes might be achieved in a self-sustained manner.

SL’s unique contribution to this complex of ideas lies in the fact that it provides a theory of behavior to underpin the policy framework. This theory, and indeed the entire approach uses an explicitly pro-poor perspective, both in assessing the outcomes, and in selecting the appropriate entry point for intervention as well as the process through which such outcomes could be achieved. More concretely, SL advocates as a starting point, the

assets and the *strategies* of the poor, not their *deprivation* or *condition* described in a passive or objectified manner. This starting point also provides an effective touchstone for the evaluation of policies, namely whether they enhance or diminish the capacity of the poor to cope with and overcome their condition, and whether they lead to an accumulation or decumulation of assets in their control.

12.3 Coping, Vulnerability, and Agency

One of the first and most salutary effects of insurance is to eliminate from human affairs the fear that paralyses all activity and numbs the soul. Seneca says somewhere *Rex est qui metuit nihil*: he who fears nothing is a king. Delivered from fear, man is king of creation. He can dare to venture; the ocean itself obeys him, and he entrusts his fortune to it. (Chauffon, *Les Assurance: leur passé, leur présent, leur avenir*, Paris, T.I, 1884: p. 296, quoted in Ewald 1991, p. 208)

Behind every initiative on poverty eradication, there is an implicit theory that defines poverty; and behind this is a theory of the relation between knowledge and power. Conventional definitions focused on income or consumption measures, which were objective and thus subject to measurement. This was essential for an approach whose aim was to assuage the anxiety of the policy maker rather than to empower the citizen. Alternative definitions have always insisted on subjective factors that determine whether a program assists the poor in dealing with the world, and in enriching their lives.

The most common indicator is the percentage of people whose *private* consumption falls below a threshold level. Consumption is felt to be a better indicator than income, since it includes the effect of consumption smoothing. However, it excludes consumption out of public or common resources, and does not have information on the distribution of income within the household. The percentage indicator is also deficient in that it does not measure the amount by which someone's consumption falls short of the norm. Other indicators, such as the Foster-Greer-Thorbecke alpha-2 can correct for this deficiency by combining

incidence, intensity, and maldistribution among the poor (for a discussion, see Lipton 1996, Lipton and Ravallion 1995).

Another problem with the consumption measure is that even access to income does not necessarily indicate whether people have access to common public services: clean water, sanitation, education, and health. Finally, the fixing of the threshold norm, or poverty lines, has been the subject of considerable analysis. Typically, they are fixed on the basis of a minimum nutrition requirement. This is not an exact science, and some writers (eg Sukhatme 19??) have challenged the assumptions behind the calculations. (for a discussion and critique, see Kakwani (198?).

A more serious problem with the head count measures is that they assume that the only purpose of policy is to get people above the line. They do not have any relation with the strategies or functioning of people. This has led to the suggestion of other definitions of poverty and welfare. The basic needs approach for example examines the access to basic human needs (food, water, health, shelter, sanitation, education, and transport, see Streeten et al 1981). Other indicators looked at quality of life, measured in terms of literacy, life expectancy, and infant mortality (Morris 1979). However, these measures focused on inputs rather than functionings, and were not grounded in a unified philosophical approach.

12.4 Capabilities

Such a philosophical approach was provided later by Amartya Sen (1979) in his concept of 'capabilities'. The idea is that people consume not simply to maximize utility or welfare, but in order to be able to function. Commodities are not ends in themselves, but means to desired activities whose benefit depends upon a number of ancillary factors, including collective institutions, public resources, non-economic resources (eg gift and reciprocity), and others. See Sen (1979, 1985, 1987).

While the capabilities approach also ran into problems of operationalization and measurement, it did succeed in bringing in the issue of the subjectivity, knowledge system, and strategizing capacity of the poor. In other words, it helped provide a

mechanism through which welfare issues could be approached from the perspective of the poor themselves. Second, it allowed contextual and subjective factors to be brought into the discussion, since capabilities have to be assessed in a context, rather than through a universal metric. Finally, the approach underscored the importance of addressing poverty directly, rather than through the growth process generally.

The Sustainable Livelihoods (SL) approach goes one step further to focus directly on the coping and adaptive strategies of the poor. These include but are not limited to capabilities. The concept of capabilities is individualistic and static in nature. Coping and adaptive strategies have a dynamic and collective element. They include sharing and reciprocity as well as exchange. They also include and depend upon the collective institutions of the poor. Unlike capability, which looks at flows of consumption and activity, the SL approach looks at stocks (assets, resources, access, and skills), strategies (coping strategies, adaptive strategies), and policy and technology. Finally, they include the knowledge systems of the poor.

Just as conventional approaches use the head count of (income-based) poverty as a negative indicator of development, the SL approach uses vulnerability as a negative indicator. Vulnerability is an index of stress, capacity (capability plus resources), and potentiality.

12.5 An Alternative Framework

The SL and related approaches take what can be called a poor-centered view of social change. One of the central aspects of this approach pertains to definition of poverty. Several writers argue that the essential characteristic of poverty was captured not by incomes or production, but with what makes people fear the future, namely vulnerability (see, eg. Bohle et al 1994; Chambers 1989). To be poor is to be vulnerable. To be vulnerable is to lack control over decisions that affect one's life, and thus to lack self-respect, autonomy, security, sustainability, and self-reliance.

Robert Chambers (1989: 1) defines vulnerability as '... the exposure to contingencies and stress, and difficulty coping with

them. Vulnerability has thus two sides: an external side of risks, shocks and stress to which an individual or household is subject; and an internal side which is defencelessness, meaning a lack of means to cope without damaging loss'. In other words, vulnerability is a complex phenomenon, comprised of several contributing factors, external (shocks) as well as internal (response capacity, potentiality); objective as well as subjective; and individual as well as collective.

A fundamental element of vulnerability is its subjective nature. Self-reliance, the opposite of vulnerability, is defined not as disconnection with everyone else, but as confidence in one's ability or judgment. Conversely, vulnerability can be defined as the absence of such confidence. Confidence is built through active involvement in decision making, not through passive reliance on others. This brings out the significant role of participation, empowerment, and local level decision making. Equally, it brings out the role of local coping and adaptive strategies and local systems of knowledge as the basis for support. Poor people act on the basis of their experience with reality, not on the basis of an aggregate theoretical framework. The purpose of anti-poverty programs is to bolster their confidence in their own ability and judgment, not replace it with the judgment of experts and outsiders.

Shock or stress can be created by economic, political, or environmental causes. The role of the state can then be defined as one of minimizing shocks, protecting citizens against shock, and ensuring that they have the capacity to withstand them. Economic shocks can be caused by international, cyclical, or policy-based sources. These have become more prominent in recent years because of the globalization of the world economy. The poor will not be protected against such shocks if governments are not fiscally responsible and prudent, fiscal and monetary institutions are incompetent or corrupt, there are no cushions against financial shocks, and policy is used arbitrarily rather than systematically.

An issue that has been the subject of considerable debate in this regard is whether the best form of protection against external shocks is autarky. An extreme view contends that complete self-reliance is the only solution to externally induced sources of

instability (see, eg Amin 197?). In contrast, economists from the World Bank and IMF have argued that complete openness to international economic forces is the optimal policy (Balassa and Giersch 1986; Choksi and Papageorgiou 1986). In the middle are those who argue for a limited degree of de-linking from the world economy (Taylor 1992; Hughes and Singh 1992). Given the rapid pace of globalization, this issue may have become moot, because countries may not have the choice over autarky or openness. Nevertheless, it must be noted that the evidence shows that while the capacity of countries to withstand external shocks increases with an increase in trade exposure, it declines with an increase in financial exposure (ie, open capital markets, debt exposure) (see Banuri 1992; Banuri and Schor 1993). The recent experience of southeast Asian countries is broadly consistent with this thesis.

Another source of shock is environmental. This may take the form of normal climatic fluctuation, extreme events (floods, cyclones, earthquakes, droughts), or gradual deterioration in environmental quality (desertification, water-logging and salinity, deforestation, air and water pollution).⁴⁶ Such degradation affects the poor disproportionately, partly because they are more likely to be dependent on environmental resources for their livelihoods, and partly because they have lesser capacity to protect themselves. Indeed, environmental degradation can be defined in political terms, as the ability to export ones problems to someone else (see Banuri 1993). Environmental shocks can also translate into political shocks. A large body of literature on 'environmental security' has documented the growing incidence of civil or even international strife caused by the pressure on natural resources. (see Homer-Dixon 1994; Goldstone 1991; Myers 1989). In turn, conflict and war are the biggest sources of environmental harm. Protection against environmental shocks requires conservation policies, research and forecasting, insurance systems, information provision, and upgrade of infrastructure. Many southern

46 The different sources of shock are not independent in terms of their effect. For example, Rahman (1995) notes that the 1992 cyclone in Bangladesh and the hurricane Andrew that hit the southeastern coast of the US were storms of the same intensity; yet the first produced over 100,000 casualties, and the second only 32.

governments have been unable to undertake these functions in an effective manner because of weak capacity and lack of detailed information.

A third source of shock is political: civic and political conflicts, crime, terror, lawlessness, expropriation of property rights of the poor by the rich and powerful, and corruption and arbitrariness in government policy. As mentioned, political shocks can be caused by environmental (or economic) factors. Again, the appropriate response to such sources of stress is the establishment of strong judicial institutions, citizen oversight of law and order and judicial functions, strengthening of mass media and public interest research facilities.

12.6 Poverty and Capacity

Shock and stress are only side of the story. Vulnerability is created and compounded by the absence of capacity to cope with shock. Poverty, political and social exclusion, and powerlessness are factors that transmit and magnify the impact of shocks. The transmission mechanism is individual as well as collective. Poverty reduces the individual's capacity or resources to withstand shocks, and increases the probability of irreversible damage. It also undermines the capacity and the resources for collective action, limits access to information, and inhibits investment in protective infrastructure. The lack of access of the poor, especially the rural poor and poor women, to health care facilities means that environmental or other damage is more likely to cause irreversible harm. Illiteracy as well as the lack of access to educational facilities limits information flows, and thus information about skills and resources that can help.

This provides an alternative way of defining poverty. Traditionally, poverty is defined in terms of flow measures (income, consumption or nutrition). The SL approach, by using strategies as entry points, underscores the importance of stock measures of the assets and resources of the poor, both tangible and intangible. Tangible assets are simply physical and financial assets held by them. Intangible assets include their entitlements, their individual and collective property rights, and also their

ability to access human and financial resources through gift, reciprocity, exchange, or credit. They also include the stock of human capital, the system of knowledge that underpins the coping and adaptive strategies of the poor.

The SL approach places great stress upon the creative energies of the poor. The idea is that the poor know how to cope with their situation, and especially with change. The purpose of policy as well as science and technology should be to enhance their capacity to cope and adapt, and to make it more sustainable, both environmentally and socio-politically. In other words, SL uses the perspectives of the poor to assess the knowledge systems of scientific researchers or policy makers. This is the converse of the conventional approach.

The well-known programs of community development (eg AKRSP, BRAC, OPP, Grameen Bank) can be viewed as efforts to help the poor overcome their vulnerability by developing their individual and collective capacities. These programs provide the poor with access to credit, encourage savings (and thus the accumulation of financial assets), invest in their skills and human resources, support the construction of infrastructure, and most importantly, invest in institutions of collective action.

The above discussion can now be summarized. Starting with a poor-centered view, we define poverty in terms of its vulnerability. The lives of the poor are more susceptible to harmful impact because they lack the capacity to protect themselves against such shocks, and are more likely to suffer irreversible damage. Poverty eradication policy consists of reducing such vulnerability. This requires a combination of policies: community development and empowerment at the local level, environmental conservation, good governance, and prudent fiscal and monetary policies. It also requires investment in institutions that can deliver such policies, and a broad based access of the poor to information and support.

12.7 An Agenda for Action

Having defined poverty and poverty eradication in the above manner, it is useful to turn to an analysis of the relationship of

these variables with natural resources and natural resource degradation. As mentioned earlier, the bulk of the natural resources are in areas inhabited by the poor. Traditionally, these resources were subject to communal and collective control by villages and towns. Recent years have seen the erosion of institutions that could exercise such control. They have also been correlated with a steady degradation in the quality of resources. Finally, the poor have also been denied access to technology and skills needed to improve the management of resources.

Accordingly, a sustainable livelihoods agenda would have to be based on the strengthening of institutions that enable the poor to regain control of their environments. It would also entail the provision of skills and knowledge that would enhance the effectiveness of resource management by the poor.

The implications for the Ministry of Environment are that it should view itself as an agency that supports umbrella programs of community development and collective resource management. Thus, in order to protect forestry resources, for example, the Ministry should invest in community development organizations, which have the expertise, experience, and legitimacy in social mobilization. The country has several of these organizations. Besides the well known rural support programs, such an approach is central to the work of NGOs that work closely with community organizations. It is also explicit in the approach of virtually all social forestry programs. Finally, it has also been adopted by IUCN as a central element of its protected areas program.

In urban areas, community development organizations (e.g. OPP, Busti, KAWWS, Shehri) have naturally oriented themselves to key environmental concerns, namely pollution, sewerage management, water supply and protection of common lands.

The Ministry should treat these community development organizations as its executive arm, and use them to empower local communities to protect the natural environment. The focus of such efforts needs to be on forests, irrigation water, drinking water, sewerage disposal, and protection of common lands and common property.

Chapter 13

Environmental Health

The Administrator of the US Environmental Protection Agency, Carol Browner describes her organization as the country's largest public health agency. This description is not far off the mark. A significant policy objective of virtually every poor country is an improvement in the quality of life of its citizens. Early thinking in economic thinking assumed that the process of economic growth would automatically bring about such improvements. However, considerable subsequent experience has illustrated that such an automatic consequentiality cannot be assumed, and that direct investment in quality of life needs to be made.

In some of this literature, the quality of life issue has been presented as an illustration of the poverty eradication agenda, specifically by defining poverty in terms of lack of access to basic services and the ability to achieve a given quality of life. However, as is argued later, poverty needs to be defined in broader terms, namely as vulnerability to unanticipated shocks, threats to the tangible and intangible assets base of the poor, and interference with coping and adaptation strategies. In practice as well, poverty eradication has focused on social mobilization, community development, and capacity building. As such, it is fair to say that these countries have three distinct agendas that bear upon poverty eradication:

- Economic growth and industrialization, working mainly through the trickle down process;
- Quality of life, human development, and basic needs, focused primarily on social statistics, and involving municipal institutions; and

- Community development, social mobilization, and capacity development, goals that were led mainly by the independent sector.

As mentioned earlier, it is critical for the environmental agenda to be mainstreamed into and support the main “developmental” agendas of the country. We have examined how this could be accomplished in relation to the economic growth agenda. Later, we will look at the relation of environmental action and poverty eradication. In this chapter, we examine how it could be linked closely with the agenda of improving the quality of life. This requires transforming the environmental agencies into public health agencies.

13.1 The Quality of Life Agenda

The quality of life agenda has been articulated in two broad ways: as the construction of indicators of welfare, and as programs designed to protect and advance the agenda.

The considerable literature on the measurement of the quality of life is aimed mainly at providing alternatives to the GNP as an index of welfare. Starting in the early 1970s, a number of alternative indexes have been proposed, including basic human needs (Streeten and Stewart 197?), the physical quality of life index (Morris 197?), and most recently, the human development index (UNDP 1990). While these indices differ on specific components and methodologies, they have a broad similarity in terms of a common set of variables, namely health, education, and gender empowerment. These have variously been expressed in terms of “output” (infant and maternal mortality, life expectancy, and adult literacy, and more recently indicators of gender balance) or “input” (access to education, primary health, reproductive health, and basic municipal services, generally as well as specifically for selected groups).

The impact of such efforts at measurement is to advocate an increase of public resources going into health and education programs, and to support programs of urban development and

municipal strengthening. In institutional terms, the consequence of this agenda is typically to support the provision of resources to three sets of institutions: the education system, the curative health system, and municipal institutions.

These concerns are visible in policy discussions in Pakistan in general, and in critical analyses of the impact of structural adjustment in particular. They have focused on the strong dissonance between Pakistan's growth performance and human development indicators, and in the adverse impact of conventional policies of structural adjustment on these indicators. Comparative country data in Table 13.1 shows that indicators of social and human development in Pakistan are well below what would be indicated by the level of per capita income.

Acknowledgment of these concerns has led most notably to the creation of the Social Action Program with a protected mandate and budget. It has contributed to support for a number of programs of urban development. Given the intellectual support for this agenda and the programmatic protection provided to it by various fiscal instruments, it is clear that it will remain as a major plank of development policy in the country.

In order to ensure that the environmental agenda is harmonized with this plank of development policy, it will be necessary to respond both to the programs in which it is encoded, as well as the alternative indexes of welfare that lie behind them.

13.2 Measurement of the Quality of Life

A fundamental question is whether the environmental agenda can support and advance the human agenda. In order for this to happen, it is important to ask for the areas of convergence and divergence between the two agendas. Two important areas of convergence arise from the common interest in human health and gender balance. Health related issues are also highly visible in the overt public concern on the impact of environmental degradation. It is exceedingly important to identify and underscore these sources of agreement.

The most obvious way of approaching this convergence is by looking at how measurement of environmental quality can be tied into the measurement of the quality of human life. A brief review of the major approaches would be helpful in this regard.

The direct relationship between the above and human health can be analyzed through a more detailed discussion of the methodology of calculating “Disability Adjusted Life Years” (DALY), namely a measure of the impact of disease and disability on life expectancy and quality. This methodology enables the transformation of raw data on the incidence of disease or the impact of environmental degradation into measures of life expectancy and quality.

The basic data needed in all these cases is the ambient concentration over varying periods of these chemicals. Once these are known, the impact on human health (morbidity and mortality) is estimated from standard dose-response studies. This is then translated into what are called disability adjusted life years (DALYs), which combine the effects on mortality as well as morbidity.

The concept of DALYs was developed by the WHO to facilitate global comparisons of health assessments (for details, please see Murray and Lopez 1994; Spoor 1997). DALYs measure the number of years of healthy life lost per case of the disease. It is an indicator of the time lived with a disability and the time lost due to premature mortality per 100,000 population. The Disease Burden Modeling System (DBMS) can be used to convert raw data on disease incidence into estimates of DALYs.

The main idea behind the concept is quite simple, and is described in detail in Spoor (1997).

- The first step is to make a detailed breakdown of all prevalent diseases (e.g. infectious diseases, cardiovascular diseases) and other sources of disability (e.g. injuries). The DBMS divides diseases into three major categories: communicable, maternal and perinatal; non-communicable and injuries. Each category is further divided into sub-categories. For example, injuries has two sub-categories: Intentional and Unintentional. Each sub-category contains all the diseases for that category.
- Second, diseases are assigned disability weights, ranging from 0.0 for the least severe, to 1.0 for the most severe. The DBMS assigns these weights by dividing diseases into six categories. At the lower end, a weight of .096 is assigned to diseases that limit at least one leisure activity (recreation, education, procreation, or occupation). At the higher end, a weight of 0.920 is assigned to diseases that severely limit essential activities of daily living (e.g., eating, personal hygiene). For example, acute upper respiratory tract infections are placed in category 1, with a weight of 0.096. In principle, different weights can be

assigned to the same disease depending on ready access to health care (e.g., whether it is in rural or urban areas), gender, treatment (whether treatment is obtained), and even income classes (which may affect the general level of nutrition and hygiene);

- Third, data are collected for the incidence of each of these categories of disease. These data include:
 - ❖ the incidence per 100,000 population (e.g., 20,000 people out of every 100,000 population has acute upper respiratory tract infection in Pakistan);
 - ❖ the average age of the population contracting the disease;
 - ❖ the duration of the disease (e.g., the average duration of upper respiratory tract infections is 3.6 weeks, i.e., 0.07 years);
 - ❖ other relevant data, e.g., sex, location (rural/ urban), treatment (treated/ untreated), which may influence the severity of the impact;
 - ❖ the disability weight.
- Fourth, the simplest estimate of years lost to disability would be the product of disease incidence, severity, and duration. Under the above example, the disability adjusted life years for upper respiratory tract infections would be 134.4 ($20,000 \times 0.7 \times 0.096$). However, this does not account for several complicating factors. These include the probability of death, the difference between the average age of the population at large and the average age at the onset of the disease, and the discounting of future years of disability to make them comparable to the present.
- Fifth, the DBMS makes the above adjustments, and produces an estimate of the DALYs per case of a particular disease.
- Sixth, the burden of disease is calculated by multiplying the DALY per case of every disease with its incidence per 100,000 population, and multiplying the sum of all the DALYs per 100,000 population, with the total population.

For Pakistan, Mark Spoor (1997) estimated the burden of disease to be 47.45 million disability-adjusted life-years, or 36,500 years per 100,000 population. Data for the study were taken from the National Health Survey Pakistan, WHO publications, and published and unpublished Pakistani data. Although the study is hampered by the usual non-availability of basic information, especially on non-communicable diseases, it does demonstrate the fairly depressing situation.

- The burden of disease in the communicable category is 18,269/100,000, which is almost twenty times higher than the averages of approximately 1,000/100,000 in industrialized countries.
- Burdens of 872/100,000 for maternal diseases and 2,985/100,000 for perinatal diseases are more than ten times the averages in industrialized countries.
- The category of unintentional injuries has a total burden of 2,700/100,000, which is about three times the average in industrialized countries. These stem largely from traffic and industrial accidents.
- The overall burden in non-communicable diseases is only slightly higher than in industrialized countries. While much of this may be resistant to applications of current health knowledge, there are areas where considerable improvements can be made. For example, the burden in the nutritional/ endocrine category is ten times that for industrialized countries, while that of congenital abnormalities is about four times the latter's average. Spoor suggests that the main reason for this is the poor state of nutrition that accompanies poverty. To this could be added the poor state of environmental conditions in such areas.

The assessment of the contribution of environmental degradation to the burden of disease requires additional assumptions. Brandon (1995) estimates the cost of environmental degradation in Pakistan under one approach, which is not directly comparable with Spoor (1997). For example, according to Brandon, the bulk of the costs come

from air pollution, especially the impact of lead pollution on mental capacity, a component that is missing significantly from Spoor's estimate of disability. Rather than attempting to integrate the two studies, we present a simple set of assumptions to extend the Spoor data. The integration can be accomplished in a subsequent draft.

Many of the diseases included in DALY estimation have significant environmental background. In order to simplify the analysis, we divide these into three broad categories, namely those where environmental degradation is the primary cause of the disease, where it is a significant contributory factor, and those where it makes a smaller contribution. We have assigned, somewhat arbitrarily, weighting factors of 1.0, 0.5, and 0.25 respectively to diseases placed in these categories. More precise weights can be assigned after a more detailed study on the environmental conditions and their impact. Table 13.2 presents a list of these "environmental" diseases, along with their respective weighting factors. It shows that environmental causes are responsible for approximately 16,350.4 disability-adjusted life years for every 100,000 population, i.e., for almost 45 per cent of the total burden of disease in Pakistan.

In other words, out of the average loss of 47.45 million life years due to disability or disease, 21.18 million years are contributed by environmental degradation. Although this is likely to be an underestimate because of the paucity of data on morbidity and mortality, it does bring out the intimate relationship between environmental health and human health, and between environmental action and the quality of life.

Spoor argues that Pakistan despite the existence of a decent medical care system, has not made the epidemiological transition through which the impact and spread of infectious and communicable diseases is checked. While his explanation is very brief, it seems to be focused primarily on the limitations of the health care system, and not sufficiently on the inadequacy of environmental protection. One reason is the absence of detailed studies on the relative health impact of environmental degradation and other contributory factors (poor quality and inadequate reach, especially to women and the poor, of the health delivery system, inadequate nutrition). Likewise, there are no studies in Pakistan on the comparative costs and benefits of improvement in each of these areas.

Rogers *et al* estimate that the annual cost of remediation of environmental degradation problems in Pakistan is \$1,076 million (1990 prices), or 2.57 per cent of GDP (pp. 142-144). As shown in Table 13.3, the bulk of this figure is allocated to the remediation of land degradation. However, about 40 per cent (equivalent to 0.9 per cent of GDP) pertains to air and water pollution and solid waste management, i.e., sectors where the main cost is in terms of human health and quality of life. A second link is by invoking the analogy of remediation to human health. Under this approach, the impact of environmental degradation on human health can be measured in terms of the compensatory expenditure to restore one's health. This is in addition to the costs imposed by the direct burden of disease.

Table 13.3
Cost of Remediation for Pakistan

	COR (million US\$ in 1990 rates)
Water	53.97
Air	119.49
Land (erosion)	522.59
Solid Waste Management	187.21
Forests	157.40
Ecosystems	36.09
COR (total)	1076.76
COR per capita	9.58
COR as percent of GDP	2.57

Source: Peter Rogers et al 1997. Measuring Environmental Quality in Asia.

To summarize, the direct link between a conservation strategy and the quality of life is through the impact of degradation on human health. This is measured through the technique of disability adjusted life years, combined with the dose-response statistics on air and water pollution and particular diseases. An alternative approach looks at the costs of remediation, i.e. at the cost of bringing the environment up to a particular level of quality. This can be extended to assess what it would cost to achieve a certain quality of life. Both these approaches provide an incomplete picture of the health costs of degradation, since neither looks at the individual and social expenditures on health improvement and maintenance. Be that as it may, both suggest a fairly high impact of environmental degradation on health and the quality of life.

13.3 Quality of Life Programs

In Pakistan, a number of programs are aimed directly at improvements in the quality of life. However, as witnessed by the low level of the indicators of such quality, they have not achieved a great deal of success. The reasons have to do with their neglect of environmental factors as well as a reliance on inappropriate institutional and process models. The establishment of clearer links between the environmental

agenda and the quality of life agenda would, besides its environmental benefits, also help provide the requisite impetus to the latter agenda.

At this moment, the two main categories of programs that focus directly on the quality of life are the Social Action Program (SAP), and the Urban Development Programs. SAP was started in 1992, and is now in its second phase. Its focus is on the provision of primary education, primary health, clean drinking water, and sewage disposal. These programs are to be implemented by the provinces, generally through local government organizations, and often with the involvement of NGOs. A recurring theme of the program is the partiality towards participatory approaches. The main result of the SAP has been to protect the social sector, defined strictly in the above terms, from budgetary cuts. It has also contributed somewhat to collaboration between governmental agencies and NGOs, though perhaps not as much as appears to be needed.

Various urban development programs have also been implemented since the early 1990s, and have been replenished. These programs are focused mainly on large metropolitan centers, and seek to provide resources for urban planning, provision of basic urban services (drinking water, sewage disposal, and urban development). However, their effectiveness has been limited greatly by the weakness of municipal institutions.

Neither SAP nor the urban programs exhibit a conscious attention to environmental concerns. However, a better linkage would benefit both programs. On the one hand, it would provide the environmental strategy with a clear social goal, namely an improvement in the quality of life. On the other hand, it would provide the existing programs with greater policy coherence and effectiveness.

In order to develop this synergy, it is important for the links to be demonstrated clearly, as indicated in the previous chapter. Furthermore, there is a need to provide a space for environmental and preventive actions that would be more effectiveness than remedial actions. Finally, there is a need to incorporate the main lessons from the first phase of

environmental action, namely the need for participation, collaboration and cooperative action in pursuit of the common agenda.

The aspects of SAP that are directly linked to the environmental agenda are health, drinking water supply, and sewage disposal. However, it focuses on curative rather than preventive health, piped water rather than clean water, and sewage treatment rather than sewage disposal. The incorporation of an environmental agenda would consist of the following:

- Inclusion of direct investments in preventive health, namely clean air, clean water, and sewage disposal as part of the SAP;
- Focus on clean water, measurement of water quality, and involvement of the users in assessment as well as improvement;
- Broader agenda of sewage disposal, relying on the existing practices in the informal sector, instead of the creation of unworkable and costly sewage treatment facilities;
- Reliance on such participatory mechanisms as round-tables, social mobilization, and participatory research and policy development.

Similarly, urban development programs are focused mainly on large urban concentrations, with only limited resources going to middle sized towns. They are also relatively innocent of participatory and collaborative methods. Finally, their explicit environmental content has not received adequate attention. It would be important to address these deficiencies by making the environment an explicit component of these programs. Indeed, these programs are in essence conservation strategies for urban concentrations. Recognition of this linkage would help improve their quality.

13.4 Summary

In summary, we have argued that there are explicit linkages between the goals of the environmental agenda and

the quality of life agenda. The ministry of environment needs to make this connection explicit, first, by sponsoring research and data collection on the variables involved, and second, by incorporating the relevant elements of the environmental agenda into the established quality of life programs (SAP and urban development programs) instead of undertaking an independent program. To this end, it should seek a broader definition of the quality of life programs and an infusion of resources from the environmental program.

Annexes

Annex 1

Terms of Reference for the Study

Background Study: Progress achieved since the NCS

Terms of Reference

Background and objectives:

1. In 1987, as part of its assistance to Pakistan to restructure its economy, the World Bank initiated the preparation of the first stand-alone environmental operation, the Environmental Protection and Resource Conservation Project (EPRC). The project design was influenced in a large measure by the results of the Pakistan National Conservation Strategy (NCS, which was completed in 1992), and focused on two key priorities: institutional development and natural resource conservation.
2. EPRC, which began in 1992, will close at the end of June 1999, and the Government of Pakistan has requested Bank assistance in developing a follow up operation.
3. The Bank and GOP agreed on the need to prepare an Environmental Strategy with a dual objective: (i) assess the progress accomplished since the adoption of NCS and the specific impacts of EPRC; and (ii) identify the top 1 or 2 priorities which could be the subject of further assistance by the Bank (and for which the Bank has both comparative advantage and a high probability of making a lasting impact).
4. In this context, a "stock-taking" exercise will be conducted and a background paper will be prepared by a consultant.

Main tasks to be performed by the consultant:

5. The team of consultants will undertake three separate but interdependent tasks:
 - a Status of progress at the institutional and policy levels:
 - identification, description, and evaluation of key institutional developments including legal framework, policy development (including financial instruments), monitoring, enforcement, public participation, etc.
 - b Status of environmental quality monitoring:
 - identification of baseline conditions (if possible 1992)
 - identification of data sources and institutions in charge of monitoring
 - summary of key environmental indicators (emission, or ambient quality) for the key environmental resources (air, water, and land)
 - summary of main findings and recommendations
 - c Status of economic reforms with significance to environmental management:
 - identification of key economic policies (fiscal, monetary, trade, pricing, regulations, technology standards, etc.) implemented since NCS, and their estimated environmental impacts;
 - evaluation of the Environmental Protection Fund and other financial instruments;
 - evaluation of the potential environmental impacts of the key elements in the policy package recently negotiated between GOPAK and IMFR/WB, including reforms in: the energy sector, land tenure, agricultural subsidies, agricultural income tax, water pricing, irrigation and drainage institutional reform (perhaps others to be identified).

Consultant qualifications, timetable, deliverables and level of effort:

- a The consultant will need to have expertise and experience in at least the following areas: (i) environmental institutions and policy; (ii) environmental economics; and natural resource management.
- b The study is expected to last 4 months, from March 1 - June 30, 1999, according to the following timetable (adjustments would be made based on date of contract signature):
 - inception report: March 15, 1999
 - draft report: May 10, 1999
 - workshop to discuss draft report: May 15, 1999
 - final draft report: May 31, 1999
 - Final report: June 30, 1999.
- c The effort level expected would be as follows:
 - Study coordination and lead consultant: one man-month
 - Environmental economist; one man-month
 - Environmental Specialist: one man-month.
 - Logistical support (Research assistant) at least one man-month
- d The consultant will gather information through research, data compilation, and the holding of at least five roundtables (one in each Province and AJK). In addition, the consultant will organize a workshop to present the findings of the study and get input from the major stakeholders before finalizing the report.
- e Funding: The budget available for this activity is approx. US \$ 40,000*, including consultant fees, communication, travel, roundtables/workshop, report preparation, and overhead).

- f The contract will be issued --as a lump-sum contract in the name of SDPI who will be required to sub-contract the services of the Lead Consultant, Mr. Tariq Banuri who will be responsible for the quality and timely delivery of the final report. SDPI will provide all personnel --except for the Lead Consultant --involved in the preparation of the report (Environmental Economist, Environmental Specialist, support staff and logistics).
- g The final report should cover at least the following topics:
 - i a detailed review and assessment of the legal/institutional framework and accomplishments since adoption of the NCS
 - ii a detailed review and assessment of environmental quality data, particularly relating to air and water pollution, and natural resource degradation;
 - iii a economic evaluation of the environmental impacts of the Macro-economic reforms as agreed with the IMF and World Bank; and
 - iv a prioritization of key environmental issues, based on the discussions with key stakeholders (workshop) and the results of (i)-(iii) above.

Supervision of Consultant

6. The consultant will report to the Mr. Aziz Bouzaher, the Task Team Leader for the study.

Note: * *For the purpose of issuing the contract, in local currency, this amount will be adjusted to reflect the local private sector exchange rate.*

Aziz Bouzaher
Thursday, February 25, 1999

Annex 2

List of individuals consulted

List of Individuals Consulted

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Annex 3

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Annex 4

Inception Report

An Environmental Strategy for Pakistan

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**Sustainable Development Policy
Institute (SDPI)
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Context and Preparation

Introduction

The following is the outline of a background study being undertaken by the Sustainable Development Policy Institute, in order to assist in the preparation of an environmental strategy for Pakistan. The study will be based on consultation with key actors and the examination of recent experience and broader context. It will define a strategic framework in order to identify one or two priority areas, which could be the subject of further assistance by the World Bank. These are areas for which the Bank has both comparative advantage and a high probability of making a lasting impact. Second, it will aim to inform subsequent review and strategic efforts, most notably the exhaustive mid-term review planned for the National Conservation Strategy. The terms of reference of the study are placed at Annex 1.

The study has three interim goals. These are a) to provide a mechanism for assessment of existing environmental policies; b) marshal expert opinion on priority issues; and c) provide a framework for undertaking further work in this area.

Assessment of performance

The methodology used for the assessment of the impact of policies is important, since it provides a signal to policy makers and other actors regarding the ultimate goals of their actions.

Assessment of the impact of conservation policies and environmental investment can be undertaken either directly (e.g., by looking at specific indicators of environmental health), or indirectly, by looking at the changes in behavior and incentives brought about by the policies. Direct assessment requires a

methodology to examine environmental health. Two significant studies on environmental conditions in Pakistan use two somewhat different approaches in this regard.

The only detailed country study, by Carter Brandon (1994), was hamstrung by the paucity of data. Brandon used Indian data on emissions and ambient air quality where Pakistani data were not available. His focus was primarily on the health cost of air and water pollution, and did not include the costs of biodiversity loss. Yet, with very conservative assumptions, he estimated the cost of environmental degradation to be as much as 5 per cent of GNP.

A cross-country study by Peter Rogers and his colleagues (Rogers et al 1997), introduces an alternative measure of environmental quality. Instead of looking at the cost in terms of lost GNP (which requires making assumptions about the quality of human life), Rogers et al use an innovative measure, the cost of remediation. In other words, they tried to estimate the costs required for restoring the environment to a "normal" condition. They estimate that unlike Northern countries, where remediation costs range around 1-2 per cent of GNP, costs in Asian countries run as high as 10-12 per cent of GNP. Their work leads them to argue for the need of external support for remediation.

In principle, the effectiveness of intervention can be measured by the changes in the level of degradation, whether measured directly in terms of a percentage of GNP, or indirectly in terms of the costs of remediation (again, as a percent of GNP). However, the difficulty arises in assessing the net impact of the intervention, after accounting for other changes (growth in GNP, population).

An alternative approach looks at the intervention itself, and tries to construct an assessment of its direct impact. This also can be done on a sector by sector basis (e.g. hectares of forests planted, and so forth), or indirectly, in terms of changes introduced by the intervention. A good example of the latter is the GEF, which after trying to present its results on a project by project basis, realized that the real impact (and indeed the real goal) of its interventions was somewhat different. As a result, they have now adopted a different indicator of impact, namely market development (see Martinot 1998). The idea is that the goal of the

intervention is to introduce changes in incentives and behavior, which would then create new markets (e.g. for energy efficient bulbs), and thus have an impact much larger than the initial intervention. On the other hand, if the project failed to stimulate new markets, its impact would remain limited notwithstanding the direct results produced.

The assessment of the conservation policies in Pakistan (including the EPRCP as well as the NCS) should be based on both these methodologies. On the one hand, the direct assessment in terms of environmental quality is helpful as guide to whether results are being produced at the national level. On the other hand, the intermediate impact, be it in the form of market development or institutional development, provides guidance to actors regarding the goal of their actions.

The direct assessment requires adequate environmental data. These will be addressed in the relevant section of the report. The indirect assessment of market and capacity development will be based on consultations with experts, policy makers, and activists. A series of consultations have already taken place, and brief results are produced below.

Expert Opinion

The study will be developed through a process of review and consultation. It will keep in view the broad socio-economic trends and the consensus of expert and activist opinion on priorities and options. There are well-articulated concerns on the need to address fundamental issues—bad governance, poverty, illiteracy, high population growth, and the adverse treatment of women—without which environmental protection will not become a reality. These concerns provide part of the backdrop against which the environmental strategy is to be formulated. It is clear that the persistence of these problems will undo much of the good that will be produced by conservation efforts. Sustainable development must, therefore be seen as a partnership exercise, in which the above goals are supported (or at least not obstructed) by the policies and actions that are aimed directly at environmental goals.

Another prior issue raised by a number of people is the need for political will behind the effort. It is true that the addressing of major social problems requires resolve as well as commitment. However, the strategic exercise can only provide a general guidance on the issue. First, to build on the commitment that does exist. Second, to treat political will as a diverse entity residing in the entire polity, and not only in one person. Third, to tailor actions that would help mobilize increasing political commitment over a long time.

The third point raised in most discussions is that strategies must be formulated on how things actually work in the field, not on abstract, theoretical reasoning. In practice, people make decisions about housing, about wastes, about biodiversity, as well as about conservation. The goal should be to understand how these decisions actually work, and especially how the problems are overcome in real life. This understanding will help in selecting strategies that build upon the efforts in the field, rather than trying to replace them. Thus, instead of asking how to allocate a given quantum of resources to competing ends, the analysts need to ask some of the following questions.

Resources: What are the possible sources of funds for the environment? Domestic? International? How can they be mobilized? How can they be protected against diversion, misuse or misallocation?

Capacity: Which organizations have the capacity to undertake what tasks? How can they be supported in doing so? How can the capacity be deepened and broadened?

Political Will: Who are the champions of the environment? In the government? In civil society? How can they be supported in their work? How can their influence be expanded?

Indicators: How can progress be assessed?

The Context and Resources

Finally, the answers to the above questions are being sought and the analysis conducted in a particular and highly charged socio-economic context. This context has to be kept in mind while setting out the framework or assigning priorities. To begin with,

the domestic fiscal crisis and the global economic situation suggest that new and additional developmental resources for the environment will be difficult to mobilize from conventional sources, especially from the domestic budget. Instead of placing exclusive reliance on conventional sources, therefore, the strategy should rather seek to combine conventional and non-conventional approaches in innovative ways. Indeed, the traditional resources should be targeted to areas with largest potential payoff, namely those that can mobilize complementary resources (implementing capacity and political will, as well as additional financial resources). Equally, the effort must be to identify areas in which change can be produced through policy changes rather than budgetary outlays.

For several environmental goals, specifically those with global benefits, significant resources can potentially be mobilized from international sources. However, access to these is fairly restrictive and depends on the (extremely unevenly distributed) capacity of implementing agencies to utilize such funds effectively and transparently. In Pakistan, only a few agencies have demonstrated such capacity. Given the potential size of this source of funds, however, a significant element of the strategy must be to support agencies (both governmental and non-governmental) that have already built up such capacity, and to replicate their experience in other organizations.

A better-known source, bilateral and technical assistance programs, can also be expanded as the implementation capacity is built up. The strategic framework and investment should help in enhancing the size of such flows, primarily by improving the effectiveness of their allocation and use. In the past, these resources have been allocated fairly effectively, largely but not exclusively through non-governmental organizations. It is time to consider how to structure these inflows in the manner of the social action program, thus leveraging the technical assistance resources with domestic resources, which are protected from normal budgetary cuts. However, such considerations should not be at the expense of the openness of the process through which these resources were allocated in the past, and especially the provision of access to resources on the basis of efficiency of use. Attempts

to centralize the control of resources in the hands of a single agency would be extremely problematic at this stage.

A third source is domestic non-budgetary mechanisms. Examples are pollution charges (adopted by the FPCCI general body), user fees, and others. The strategy must outline the nature and potential of such resources, and guide action in mobilizing them fully.

Intermediate goals: Capacity development

Besides the managerial capacity, the commitment to the environmental agenda is also distributed quite unevenly, albeit fairly widely in the country. This can be seen as a type of a coalition of stakeholders: political leaders, government officials, thinkers, activists, and labor and business leaders. This coalition provides a basis for political will (as well as a substitute for it) and needs to be sustained and supported in its efforts.

In general a central goal of the strategy must be to both support and deepen commitment and capacity—and thus the capacity to attract funds. Such support is premised on an understanding of at least three areas. First, the actual recent experience of decision making on and implementation of environmental programs; second, the financial management and implementation capacity of non-governmental as well as governmental agencies engaged in such action; and third, statistical information to assess the efficacy of implementation.

Organization of the study

The study will be organized in five sections, as follows.

Section 1

Introduction

Domestic

Global

Section 2

Progress at institutional and policy levels
key institutional developments
legal framework
environmental monitoring and enforcement
awareness
public participation

Section 3

Status of environmental quality monitoring
baseline conditions
data sources and institutions
key environmental indicators
an assessment

Section 4

Sustainability impact of economic policies and reforms
key economic policies
sectoral policies
market based instruments
financial instruments
IMF/WB package

Section 5

An integrated framework
capacity
resources
commitment and will
assessment
priorities

Section 1

The introductory section will provide the economic and political context for the strategic exercise. It will review briefly the domestic as well as international trends. The latter include the following:

- The adoption of a number of international agreements (FCCC, Agenda 21, CBD, GATT);
- the creation of international institutions (WTO, GEF);
- the declining trend in international official development assistance (compensated imperfectly by a disproportionate growth in private financial flows);
- the global financial crisis, especially in East Asian and Eastern Europe; and
- the special situation of South Asian countries after the nuclear explosions and consequent sanctions.

The domestic trends include the following:

- the fiscal and payments crisis in Pakistan;
- the economic reforms package signed by the Government of Pakistan with the IMF/WB;
- the economic and policy initiatives currently in place, including the 2010 program, the institutional reforms initiative, and a number of sectoral policies (especially energy, agriculture, and industry); and
- the growing role of civil society institutions in the country.

The introductory section will also set out the consultative methodology adopted for the study. Already, five brainstorming meetings have been held one in Islamabad and one each in the four provincial capitals (see Annex 4a-e). Through these meetings and direct conversations, some of the leading environmental experts, activists, and practitioners in the country have been consulted (see Annex 2). The consultations focused mainly on reviewing progress, obtaining information on future plans, and discussing criteria for the selection of priorities. Besides this, a number of documents, mainly in the “gray” literature have been consulted with a view to eliciting plans, reviews, and ideas (Annex 3).

These consultations will be continued with the evolution of the study. The draft report will be presented to the “collegium” of environmental experts and activists. The presentation will be used to revise and finalize the strategic framework as well as to identify priorities for action.

Section 2

Section 2 will provide a review and assessment of experience and progress since the adoption of the NCS in 1992, which coincided with the signing of the agreement on the EPRCP.

A cursory review of progress reports suggests that the main achievement to date has been in three areas: environmental awareness, institutional development, and legal framework development. These are, in a sense, the pre-requisites of action. They were emphasized in the NCS Plan of Action 1993-98. The retrospective assessment will try to deepen our understanding of three sets of issues. First, to what extent was the first phase successful, and to what extent has the stage been set for the next phase of action? Second, what elements of the successful experience are critical (e.g., the ability to manage large projects) and need to be protected and sustained? Third, to what extent is this experience incomplete, and thus requires the provision of other infrastructural elements in order to sustain the next phase. These may include, for example, the development of quality indicators and monitoring (Section 3).

A key element of the analysis of recent experience is the nature of popular participation in decision making on environmental issues. Starting with the NCS, and followed up in the NEQS roundtables, consultation and participation have been a central feature of environmental action in the country. This has contributed a positive energy to the process and needs to be sustained.

The study will also try to understand the basis for enhancing the profile of environmental concerns in the government. This is related to a number of factors, including the budgetary allocation for the environment, the capacity of the governmental environmental organizations, and overall awareness of environmental concerns. An SAP-type provision might be a way of enhancing the intra-governmental profile of the issue, provided that this does not lead to a monopoly over financial resources in governmental hands.

Section 3

This section will examine the status of environmental monitoring. It follows directly from the issue of institutional development and environmental awareness. Both of these require solid and credible data to be sustained over a long period.

The main agency responsible for data collection and organization is the Federal Bureau of Statistics. cursory examination of the data being organized thus far suggests adequate coverage in some areas (water management, drainage), excellent snap shots in others (energy sources and demand, forests), and sporadic in others (air and water quality, rangeland quality) and virtually non-existent in others (biodiversity).

At this moment, not much effort has gone into the construction of indicators of environmental quality. One of the goals of this study would be to assess the quality of the data with reference to the major indicators suggested in the literature. It will lead into a recommendation for systematizing data gathering and reporting.

Section 4

This section will undertake a sustainability impact assessment of key policy initiatives. The goal is on the hand to provide a methodology for undertaking such exercises when policy initiatives are being discussed; and on the other hand, to ask how policy making can be used as an instrument for sustainable development, at par with public sector investment.

Section 5

The final section will pull together the previous elements into an integrated strategic framework. As mentioned, the framework will emphasize issues of agency and resources mobilization. This will help in the subsequent elaborate exercise planned for the NCS. It will also help in the consultative phase aimed to identify funding priorities for the World Bank.

Study Team

The Study will be led by Dr Tariq Banuri, Research Advisor, SDPI, working in collaboration with Dr Shaheen Rafi Khan and Mr Asad Naqvi.

Time Schedule

January-March 1999: Brainstorming sessions and consultations

April 8, 1999: Inception Report

May 15, 1999: First draft Report

mid-May: Second set of consultations

June 15, 1999: Final Report

Annex 5

Islamabad Roundtable Meeting

**Islamabad
January 12, 1999**

1. Purpose

Funding for the preparation of the NCS and the World Bank's stand-alone environmental operation, the EPRCP was secured in 1987. In 1992, both documents were finalized. The NCS identified 14 core areas for intervention, mostly of a sectoral nature but including cross-cutting, integrating initiatives as well. Both programs dealt with institutional strengthening in federal and provincial governments and in the non-governmental sector.

Six years down the line, the NCS has reached the halfway mark, while the EPRCP is reaching closure. What have been their successes and failures? Is there a need for mid-course correction based on lessons learnt? What direction should future strategies take? The purpose of the roundtable was to stimulate discussion on these issues among key stakeholders in the government, non-governmental, private sectors and the donor community. The immediate impetus for such an exercise came from the World Bank, which has requested assistance in identifying areas in which they should invest. The broader goal is to prepare a paper which will distil the key elements from these discussions – as from those provincial and regional roundtables which are to follow during this month, and which will be of value to the stakeholders involved in environmental conservation and management.

The aim of the review is to evaluate and assess achievements (outputs), policy, institutional and legal initiatives, resource allocation and expenditure, the extent of integration among diverse activities and their mainstreaming into the national development programs and the quality and continuity of data collection for environmental program and project assessments. Participants are also requested to selectively identify documents (reports, research papers, planning papers) which will assist in the review.

Guided by past performance the strategic exercise will focus on setting priorities for the future, integrating environmental activities in the broader context of sustainable development, setting targets, identifying resource mobilization options and establishing a continuous data collection mechanism for monitoring, evaluation and research purposes.

2. Review of Past Performance

The review was damning. A key failure related to the NCS process. While the NCS was instrumental in establishing environmental policy, institutional and legal mechanisms (standing Senate and Parliamentary Committees, the MOE-NCS Unit, the Environmental Section of Planning Commission, provincial EPAs, PEP Act 1997, and environmental tribunals), the ground reality was bleak. All environmental indicators point towards increased—often critical—levels of pollution and degradation (water, air, soil). In fact, this across-the-board deterioration was, largely, a symptom of institutional failure, reflecting human, technical and financial resource deficiencies. Other contributing factors were lack of inter-sectoral interfaces, inability to mainstream the environment into national development policies and marginalisation of communities and civil society representatives in policy planning, decision making and implementation. Thus, while the NCS formulation process was admittedly participatory, for all practical purposes the document was seen as a top-down ‘cook-book.’

The review included the following additional critiques:

- A strong bias towards brown environmental issues and relative neglect of green sectors
- Pakistan had signed and ratified many global conventions but lacked the technical capability to extract the financial, technical and research benefits embodied in such conventions
- The pollution of soil, air and water and land degradation had imposed heavy economic and social costs.
- The business community had not been able to exploit the economic opportunities arising out of, or pre-empting,

environmental regulations, as had been done in the West (environmentally friendly technologies).

- Demographic pressures were a cross-cutting environmental stress.

3. Future Strategy

The discussion on future strategy required the participants to focus on the following:

- Establish environmental priorities (as a starting point out of the 14 core areas)
- Suggest indicators and targets (direct and indirect, physical and process)
- Propose innovative resource mobilization mechanisms
- Suggest an effective and focussed data collection mechanism

Priorities

Priorities were classified according to enabling conditions, social inputs and environmental priorities. These are tabulated below.

The recommendations are heavily weighted towards enabling conditions, suggesting the need for cross-cutting institutional interventions rather than sector specific initiatives.

Indicators and Targets

Indicators were seen as being physical and process based. They subsumed direct and indirect indicators at macro, sector and regional levels. Key areas were identified, indicators suggested and experts designated to develop them further. Illustratively, these were:

Water:	Water quality, levels of permissible salinity for downstream off-takes, indicators of irrigation performance (IIMI, IPTRID), impact of water diversions on upstream and downstream affectees
Air:	SOx, NOx monitoring (stations),
Forestry:	Planting, area, asset value, forest cover
Watersheds:	Vegetation cover, soil erosion, rate of sedimentation, coverage and species
Energy:	Energy intensity, per capita consumption, indicators for renewables
Pesticides:	Residues, use

A need was expressed to convert these indicators into time-bound targets.

Data Collection and Availability

Because of an inadequate and irregular database, environmental planning, monitoring and evaluation was tentative and speculative. There was a need to institute a regular data collection, analysis and research process.

Resource Mobilization

The Foreign Minister's proposal for a protected SAP-like umbrella financing mechanism for environmental activities was strongly endorsed.

Annex 6

Karachi Roundtable Meeting

**Karachi
January 30, 1999**

Morning Session: Review of Past Performance

- Chair:** Tasneem Siddiqui, DG, Katchi Abadis Authority, Sind
- Speakers:** Parvez Naim, IUCN, Brigadier (Retd.) Akhtar Zamin, DG, EPA, Shaheen Rafi Khan, SDPI
- Moderator:** Roland DeSouza, SHEHRI

NCS

Ground realities were not taken into account when the NCS was being formulated. Beneficiaries were excluded from the decision making process. The outcome is foreign funded programs, which have saddled the country with debt. The programs are too high-tech when, in reality, the solutions are simple and people-sourced. Additional concerns in program implementation are poor governance and a donor preoccupation with utilization of funds.

Protagonists countered that the lack of institutional capacity was the missing link between the ground reality and the NCS. However, the NCS had served its purpose in highlighting environmental issues and, in essence, starting the process. Both Sindh and the Punjab were remiss in not following through with provincial strategies. The NWFP (SPCS) and Balochistan (BCS) had not only developed provincial strategies but were in the process of formulating district level strategies as well. Also, its development plans now included EIAs.

The Sindh EPA's jurisdiction was to monitor, regulate and advise. It was not an implementing agency with authority to enforce. The DG went through a list of achievements (mass awareness program, banning black polythene bags, lab to monitor NEQS, waste water treatment plant, potable water testing)

Core Areas

Waste Disposal (Core Area 11):

Only 35% of solid waste produced in Karachi is collected. The collected waste is hijacked and burnt for metal extraction. Sewerage and treatment plants are not connected. There are 3 landfill sites (500 acres each) and a variety of imported machinery (donor funded) which is not utilized. The KMC and KDA are overstaffed and possess a large vehicle fleet, which is badly in need of maintenance. Both coordination—within and across departments—and accountability are lacking. The Karachi Master Plan epitomizes these deficiencies and highlights the pernicious nexus between consultants, engineers and contractors.

Preservation of Cultural Heritage (Core Area 14):

The existing law in Sindh focuses on historic monuments rather than small mercantile/ urban structures (footsteps of history), which are regularly savaged by the demolition mafia.

Increasing Irrigation Efficiency (Core Area 2):

The issue was basically one of water appropriation rather than efficiency. The ‘*wadera*’ draws off amounts in excess of his needs at the watercourse head, leaving little for the tail reaches. This caused water logging and salinity. Nepotism in the line departments gave rise to incompetence, corruption and collusion with the ‘*waderas*’.

Afternoon Session: Strategy for the Future

Chair: Dr. A. Samiuzzaman, FPCCI

General

The basic problems, which needed to be addressed first, were identified as population explosion, illiteracy and poverty

NCS

Identify institution to develop the Sindh Conservation Strategy, most probably the P&D department. A 2-3 year prior consultation and prioritization process will be required. This should involve the EPA, NGOs and assistance by IUCN. Distribute copies of the NCS to the stakeholders.

An effective approach would be to focus on market forces and on incentives to conserve. Funding becomes a point of greed so why not self finance. In general, respond to indigenous forces, experiences, and motivations. Examine conditions for self-financing: Users have capacity and willingness to pay and awareness about needs exists. There needs to be a clear definition of roles for the actors involved—government, private, NGOs, communities.

Observation:

The exercise is overextended. The time frame for the study is too limited to develop a comprehensive strategy. A better way to go would be to look at existing initiatives and take one sector at a time.

Core Areas

Managing Urban Wastes (Core Area 11):

There is a need to tone down programs, reflecting manpower and resource constraints. These programs should be built around incentives, self-help efforts, take advantage of demonstrated willingness to pay and begin as small, implementable and replicable pilot programs. The conceptual framework should take institutional capabilities into account, as well as the potential roles of other stakeholders within the private sector and among communities. The OPP and *Gulbahao*'s, 'Garbage is Gold' programs were illustrative of what could be done cheaply and effectively.

Preservation of Cultural Heritage (Core Area 14):

Fund people to restore their heritage, use existing institutions (KDA) where necessary, develop awareness programs and legal

mechanisms which empower communities, allowing them a say in urban construction and traffic routing.

Preventing/Abating Pollution (Core Area 10): Vehicular Emissions:

Awareness Creation: Identify the target audience and create awareness through the Urdu press and TV. Highlight the health problems and economic benefits. Conduct stakeholder seminars (Rickshaw Association, public transporters, NGO representatives).

Implementation and Enforcement: Establish an implementation team, consisting of police, EPA and NGOs—the latter to ensure accountability. Modernise police inspection department by providing voice emission and diesel regulation analyzers. Make lead free petrol mandatory. Ban older vehicles. Impose ban on automatic transmission vehicles.

Technologies: Rickshaw conversion from 2 to 4-stroke engine. Develop long-term program to convert public transport to CNG. Introduce catalytic converters

Projects: Develop vehicle monitoring project. Establish dumping grounds for grounded vehicles.

Protecting Water Bodies and Sustaining Fisheries (Core Area 6):

Pakistan has a 990-km coastline, which is not patrolled, beyond the 12-mile zone. There are potential problems of pollution beyond this zone, posed by tankers fuelling in the Gulf States. The Maritime Security Agency is entrusted with patrolling the area but is severely hamstrung by shortage of personnel and equipment. There is a need to develop a national policy as well as project support for the MSA. Among others, the benefits would also accrue to refineries and coastal industries (KANUPP, Hub) which circulate seawater in their systems.

Expectations from this study (Aban Marker Kabraji, IUCN)
To define a strategic framework and priorities which will be picked up by The NCS Mid-Term Review.

Annex 7

Lahore Roundtable Meeting

**Lahore
February 25, 1999**

Facilitators: Mohammad Tahseen, Irfan Mufti

Review of Environmental Policies

Political will and a foolproof mechanism are the two key missing elements inhibiting implementation of the NCS. Policy makers pay lip service to the environment, confining on-the-ground activities to a virtual reality. The NCS document is too complicated for the layman. Even NGOs and other organizations working in the environment field do not really know which activity falls in each of the core areas of NCS. It defies belief that a document formulated through a consultative and participatory process could become so abstruse and incomprehensible. To make a difference NCS needs to be brought down -- in terms of simplifying issues, readability and understanding of the document -- to the grassroots level. The message is, 'keep it simple.'

Frequent changes in governments produce policy discontinuity, which has damaging effects both on the environment as well as on the economy. For instance, an incumbent government starts a canal project but is toppled before the lining can be completed. The succeeding government shelves the project and retains the staff. Resultantly, there is both a fiscal cost and adverse environmental impacts in the form of water losses, waterlogging and salinity.

Institutions responsible for implementation of environmental policies, such as the forestry and agriculture departments, lack the capacity, expertise and financial resources for effective outreach to farmers and communities. Where extension staff do function, it is only to develop expert-rich client relationships. The Punjab Agriculture Department promotes chemical-dependant intensive

agriculture and cash cropping, which leads to soil degradation, damages agricultural biodiversity and discourages tree plantation.

Another missing dimension is a research focus on indigenous varieties. The existing research is structured around limited trials with imported varieties, which are then replicated prematurely and prove environmentally harmful. Eucalyptus plantations and long fibre cotton are two such examples. Research institutions need to shift their focus to indigenous varieties and traditional systems, which have, historically, maintained a balance between ecology, environment and population. Data on environment also needs to be generated as a basis for this research. In addition there is a need to break the anti-environment multinational-local network for fertilizers and pesticides distribution which is causing ravages in Southern Punjab.

Uncertainty regarding rights of access restricts environmental initiatives. The provincial government encouraged CBOs/villagers in Multan to plant trees on 'shamlaat' lands. Subsequently, they were informed that ownership of these lands resided with the forest department. Communities have little access to legal recourse on such issues.

Other crosscutting themes identified were:

- Gender
- community participation
- population
- data/database,
- co-ordination within and among different departments/sectors
- developing institutional linkages (institutionalizing co-ordination)
- governance
- appropriate technology

Financial Mechanism

Identify local funding sources, which encourage ownership. External funding should come with an in-built feature for generating income.

Annex 8

Peshawar Roundtable Meeting

**Peshawar
March 11, 1999**

Chair: **Dr. Musharraf Rasool, Chief Economist, P&D Department**

Facilitator: Mr. Gul Najam Jamy, Director, SPCS - IUCN

Speakers: Ms. Mishka Zaman, SUNGI

Mr Irshad Khan, Senior Planning Officer, and SPCS Coordinator, P&D Department

Review of Environmental Policies

Implementation of the NCS

Problems in implementing the NCS were traced to flawed conception and the absence of political will. The institutional initiatives framed within its ambit at the federal and provincial levels had been undermined by the absence of political support. Functionally, such institutions were ineffective. Thus, the PEPC had not convened since the new government took over, though this was constitutionally mandated. Federal and provincial EPAs were hamstrung by their inability to enforce compliance with the NEQs -- although they were charged with monitoring and creating awareness about pollution hazards. By the same token, environment tribunals and magistrates remained defunct. New environment units created within existing institutions, such as in the Ministry of Environment, the Planning Commission and provincial P&D departments were, at best, able to effect cosmetic changes -- for instance, requiring that PC1 documents add columns on the environment and gender. This was further underscored by the fact that these entities and units were understaffed, underfunded and technically and informationally weak. While the upgrade of the EPA (1997) was commendable, it

tended to be defined by its nominal rather than substantive content.

The institutional critique raised basic questions regarding the role of the state in environmental management. Should the state be an active environmental manager and policeman? Should it limit its role to addressing market failure or providing incentives, leaving active management to the private sector, NGOs and communities? Was there any need to manage at all, given the self-regulating and self-healing capacity of the commons?

A priori, there was no reason why the state could not be both a developer and a protector. However, its over-riding role had been that of a developer. The latter function required key policy paradigm shifts and associated organizational changes, which had not been forthcoming. This was apparent in the vertical orientation of departments, when the environmental norm required lateral integration. Similarly, professional staff within departments tended to ‘think deep rather than broad.’ It, therefore, came as no surprise that the institutional initiatives taken under the NCS emerged as ineffectual adjuncts to traditional department functions. Also, within the existing parameters conceding enforcement powers to EPAs and tribunals would be tantamount to ‘strengthening the brute power of the state.’ It was an acknowledged fact that regulations tended to be employed in the interests of the forest department, politicians and assorted mafias.

The institutional context remained highly centralized. All policies, plans (PSDP), budgets (allocations) were determined at the federal level. Provincial P&D departments framed their plans, allocations and policies within federal guidelines. The line departments were passive implementors. The long hierarchical process created disjunctures between policy and implementation and was weakly monitored. A consequence of this was degradation, waste and corruption.

Programmatically too, there were problems with the NCS. Relative to its broad operational sweep (14 core areas), the NCS had not devised a workable management strategy. Moreover, implementation was presumed upon institutions, technical capacity and complex linkages that did not exist or could – at best

-- be developed incrementally. A more focussed and prioritised approach would have yielded dividends rather than the diffused outcomes which presently characterised the NCS. Some aspects of process and operational failure were lack of cost-benefit analysis, the absence of coordination mechanisms between project units and provincial departments and the absence of private-government partnerships to implement various programs in the core areas of the NCS. While there was no dearth of such programs, the lack of political commitment and a supporting policy and institutional framework raised serious questions regarding their sustainability.

Sarhad Provincial Conservation Strategy (SPCS)

The SPCS had attempted to address some of the weaknesses of the NCS. Its project approach was more holistic, focussing on cross-cutting issues such as the poverty-environment nexus, good governance and environmental awareness and education. A key initiative under the SPCS was the land use study, in recognition of the fact that inappropriate land use was the root cause of environmental degradation in the NWFP.

Important institutional and legislative initiatives taken under the SPCS were the establishment of the Provincial Forestry Commission and the New Forestry Act. With a view towards forging broad-based consensus on these initiatives, the SPCS was promoting consultations through roundtables and designated focal points.

NGO Perceptions

An understanding between the government and the NGOs in the NWFP continued to remain elusive. NGOs tended to have a better grip on ground realities and were active in their efforts to bring the government up to speed on environmental issues and concerns. In contrast, the government was opportunistic in its dealings with NGOs. It tended to sideline them in the policy

reform and legislative process.⁴⁷ However, there was greater willingness to involve NGOs in projects, given their acceptability to communities and in view of its own financial and administrative limitations. Ultimately, however, delegation without empowerment was not enough to ensure project sustainability.

Clearly, NGOs had limited outreach relative to the government; by the same token, the latter's fiscal and administrative weaknesses were apparent. Viable partnerships aimed at maximising synergies were the solution but should be premised on equality. NGOs had much to offer: they could give global agendas a local flavor (climate change) or protect indigenous knowledge from external threats (patent rights). They were excellent communicators; for instance, NGOs could generate awareness about the NCS at the local level. Not least, through their grassroots organizing and networking efforts, they could broad base critical conservation issues and translate them into a sustainable livelihoods context.

It was necessary to give NGOs and civil society the requisite institutional space by amending the presently inimical legislation and regulations. A corollary to this was that reforms needed to be instituted in a more consultative manner. Also, macro and sectoral policies could be modified to build in environmentally friendly responses. Finally, a civil society culture and role needed to evolve to complement NGOs and motivate policy and institutional change.

There was self-assessment by NGOs as well as external criticism. For instance, SUNGI saw itself as a professional organization, which should aim for a 'strategic withdrawal.' AKRSP was donor driven, consisted of first rate professionals but was evolving into a clone of the LGRDD; while it presently covered 70% of the rural areas, a majority of its VOs were likely to fall apart eventually. The OPP consisted of first rate activists

47 For instance, the forestry reform process was being stalled at the departmental and political level. As community representatives, NGOs threatened the territorial status quo of forest department officials, as well as the vested interests of large forest owners, who had clout in the provincial assembly.

but had yet to develop an institutional character. Basically, however, these were felt to be academic exercises. There was no established taxonomy of NGOs with many extant indigenous models each occupying its own space. NGOs came into existence because they were needed and, as long as sustainable livelihoods issues were not resolved, they would remain.

Strategy Session

Proposals for future strategy reflected institutional concerns. The recommendations focussed on institutional reform, people's participation and financial sustainability.

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