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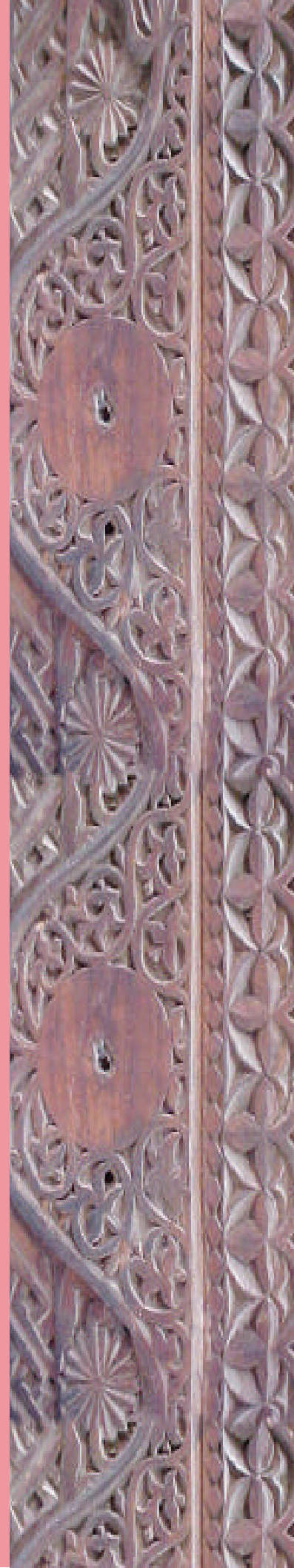
Population, Poverty and Environment

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LIST OF ACRONYMS

AKRSP	Aga Khan Rural Support Programme
AKDN	Aga Khan Development Network
AKCSP-P	Aga Khan Cultural Services, Pakistan
AKES	Aga Khan Education Services
AKHS	Aga Khan Health Services
AKU	Aga Khan University
BACIP	Building and Construction Improvement Programme
BAEJ	Baltistan Association of Environmental Journalists
BCF	Baltistan Cultural Foundation
DFID	Department for International Development
FWO	Frontier Works Organisations
GoP	Government of Pakistan
GCIC	Gilgit Information and Conservation Centre
HERP	Hunza Education Resource Project
HWF	Himalayan Wildlife Foundation
KADO	Karakoram Area Development Organisation
MoKANA	Ministry of Kashmir and Northern Areas Affairs
NACS	Northern Areas Conservation Strategy
NASSD	Northern Areas Strategy for Sustainable Development
NA	Northern Areas
NAA	Northern Areas Administration
NCS	National Conservation Strategy
NDO	Nounehal Development Organization
NGO	Non-Governmental Organization
NRM	Natural Resource Management
MACP	Mountain Areas Conservancy Project
PRIF	GEF – Pre-Investment Facility Project
SPCS	Sarhad Provincial Conservation Strategy
SAP	Social Action Programme
VCC	Village Conservation Committee
VC	Village Councils
VO	Village Organisations
WO	Women Organisation
WASEP	Water and Sanitation Extension Programme
WWF-P	World Wide Fund for Nature, Pakistan



FOREWORD

The Northern Areas have a unique and critical role to play in the sustainable development of Pakistan. Although they span a relatively small geographical area, the Northern Areas serve as a vital catchment for the Indus River, upon which a majority of Pakistan's irrigated agriculture and hydroelectricity depends. The Northern Areas also contain the nation's most important natural forests, extensive mineral reserves, and a wealth of biodiversity. Dramatic scenery, some of the world's highest mountains, and a rich cultural and archaeological heritage make the Northern Areas one of the most visited tourist destinations in the country.

Over the last several decades, however, many of the Northern Areas' natural resources have come under increasing pressure, as a result of a growing human population and the opening of the Karakoram Highway. At the same time, it has become increasingly recognised that the isolated nature of many of the region's communities, coupled with the Northern Areas' high-altitude and fragile environment, poses special constraints and challenges to development. Perhaps more so than in any other part of Pakistan, there is a need in the Northern Areas to ensure that social and environmental considerations are fully integrated into the development process.

In response to these concerns, the Northern Areas Administration began the preparation of a Northern Areas Strategy for Sustainable Development in 1999, with the financial assistance of the Swiss Agency for Development and Cooperation, and the Norwegian Agency for Development Cooperation; technical support has been provided by IUCN–The World Conservation Union. The Strategy addresses a broad range of social, economic and environmental issues, and seeks to provide a comprehensive policy framework for the sustainable development of the region. It responds directly to the provisions and recommendations of the National Conservation Strategy, adopted by the Government of Pakistan in 1992.

In parallel, *The State of the Environment and Development in the Northern Areas* summarises in a single volume the key information gathered during the preparation of the NASSD. It is the first report of its kind to be produced for the Northern Areas, which provides a succinct, up-to-date and readily accessible analysis of the status of the most important environment and development sectors in the Northern Areas, including information on major trends and issues, the responses taken by both government and civil society to date, and strategic options for the future. It also provides a baseline against which future change can be measured and establishes the context and foundations for the Northern Areas Strategy for Sustainable Development.

During early consultations at the tehsil level, and with key governmental and non-governmental organizations 16 areas of intervention were identified as being critical for the NASSD. These include sectors like: water; agriculture; forestry; biodiversity; rangelands and livestock; the private sector; energy; urban

environment; and cultural heritage and sustainable tourism. In addition, some crosscutting themes were identified as crucial to each sector, including population, poverty and environment; communication for sustainable development; environmental education; NGOs; gender, environment and development; environmental health; and governance.

To address the needs of each of these areas, basic information was gathered through consultations and literature reviews. This data was analysed through background papers commissioned on each of the sectors and themes identified. The draft of each paper was shared with the larger community of stakeholders of the NASSD as well as experts in the relevant field of knowledge.

The papers follow a similar format: analysis of the current situation; issues; past and present initiatives in the sectors and thematic areas along with the lessons learnt; stakeholders; and recommended policy and action measures. The authors have also addressed cross-sectoral linkages and environmental concerns for the sake of more integration in planning for sustainable development.

There were constraints to developing these Background Papers and in some cases these hurdles were only partially overcome. These included the fragmented and scattered nature of information, the prevalent culture of not sharing information, contradictory and unreliable data, lack of thinking on cross-sectoral linkages and integrated planning, and lack of expertise in developing linkages with the environment.

Parts of the information of the papers were then incorporated into the State of the Environment and Development (SoED) and the main strategy, i.e., NASSD. However, since the Papers contain a wealth of extremely useful information, a decision was taken to produce a series of NASSD Background Papers.

Considering the need and importance of timely sharing information with the stakeholders, these papers are being produced without extensive editing. The authors have sole responsibility for the views expressed and data presented.

EXECUTIVE SUMMARY

Introduction

This background paper was commissioned by the Northern Areas Strategy for Sustainable Development to provide an overview of current understandings of linkages between population, poverty and environment in the Northern Areas, with a view to identifying a set of strategic directions for the future.

The objectives of this background paper are: (a) to provide an analytical overview of existing research and approaches adopted to address inter-linkages between population, poverty and environment; (b) to identify gaps in understanding and potential conflicts between adopted approaches and priorities identified by this research; (c) to identify some of the principal issues and concerns in NA, and describe a number of ongoing poverty alleviation and environmental management initiatives; and (d) to highlight policies, programmes and future actions to be adopted by government policymakers, NGOs and the private sector.

Arguments

This background paper argues that the existing orthodox view that poverty and environmental degradation are inextricably linked, and are self-enforcing is based on limited empirical findings. This orthodox view suggests that poverty and environmental damage occur in a 'downward spiral', in which it is assumed that the only way to avoid environmental degradation is to alleviate poverty. It also suggests that poor people are forced to degrade landscapes in response to population growth, economic marginalisation and existing environmental degradation.

- m Instead, this background paper argues that poor people are more often than not the victims - rather than the agents - of environmental degradation as suggested by empirical evidence.
- m Moreover, many poor people are able to adopt protective mechanisms through collective action which reduce the impacts of population, economic and environmental change.
- m In addition, this paper also argues that many current conceptions of environmental degradation are based on misinformed linkages of human activity on landscape change, and avoids many current pressing environmental problems, which currently affect poor people.
- m This paper suggests that conventional definitions of both poverty and environment are too narrow, and that there is a need for a broader spectrum of approaches.
- m An estimated 85 percent of the population is rural and relies heavily on the quantity and quality of natural resources, whose status has begun to deteriorate over time.
- m Alternatively, this paper suggests that it is better to approach the issues of

population, poverty and environment linkages from the perspective of the root causes of environmental degradation in the NAs. The rationale for this emerges from the fact that the environment does matter greatly to people living in poverty, and that environmental degradation disproportionately impacts on the poor. What this argument states is if unless attention is not focused on the causes of environmental degradation the protection of selected areas will no longer suffice. The root causes of environmental degradation are namely market, policy, institutional and governance failures.

- m The paper then suggests that it is equally important to focus on the root causes of poverty in the NAs. These include economic causes (slowdown of growth in Pakistan and lack of alternative employment in NAs); governance causes (the lack of strong pro-poor policies and institutional frameworks that reflect the realities and needs of the poor, especially those in mountainous regions such as the NAs); social causes (restriction of the rights of the poor to crucial resources) and of course environmental causes (such as deforestation, range and land degradation).

Recommendations

The poor are vulnerable to environmental degradation through its impacts on their livelihoods and their health, and through their increased exposure to natural disasters such as landslides. *The principal thrust of a population, poverty and environment strategy in the Northern Areas, therefore, should be to help the poor reduce - and cope with - vulnerability.* This, in turn, implies that the poor should be empowered to play a much greater role in regional and local-level decision-making. Future poverty alleviation efforts should also seek to build on traditional knowledge systems and local coping strategies, not only because of their inherent value and effectiveness, but also as a means of bolstering poor people's confidence in their own abilities and judgement.

In lieu of the above, this paper recommends the following:

- m Adopt a sustainable livelihoods approach such as that pursued by AKRSP
- m Develop an Enabling Policy and Economic Framework at the Macro Level
- m Develop an Enabling Policy and Economic Environment at the Regional and Local Levels

1. INTRODUCTION

"Poverty is a major cause and effect of global environmental problems"

"Many parts of the world are caught in a vicious downwards spiral: poor people are forced to overuse environmental resources to survive from day to day, and their impoverishment of their environment further impoverishes them, making their survival more difficult and uncertain" (WCED, 1987; p. 3).

These two statements by the influential Brundtland Commission capture, most succinctly, the dominant views held on poverty and environment interactions. Indeed, these statements paint a fatalistic picture of the poor although they seem plausible enough. That is, poor people are often seen as compelled to exploit their surrounding for short-term survival, but further exploitation merely enhances their poverty and the prospects for future exploitation, and leaves them most exposed to natural resources degradation.

Despite these intuitively plausible statements, the debate on the characteristics of poverty-environment interaction has been likened to a conundrum (World Bank, 1997), where several pieces of the picture have been identified including some crucial links and features, but the entire picture is still lacking.

It is because of lack of the entire picture, that the Population, Poverty and Environmental Degradation thesis is inundated with controversy. Nevertheless, the dominant viewpoint on poverty and environment reflects this image of a vicious downward spiral of need, and this why the poverty and environment conundrum is strewn with and exemplifies a 'crises narrative'. Population growth and economic change are also seen to contribute to this process (see Brown et al, 1998). "When rapid change occurs in ecologically vulnerable (urban or rural) areas (poverty reserves), then the environmental implications are greatest" (Forsyth, et al, 1998). Critics, however, especially in lieu of empirical evidence, argue that this direct relationship between poverty and environment is too simple. Downward spirals may be the exception rather than the rule; at the least, it is necessary to ask under what circumstances may this traditional link between poverty and environment be found to operate, rather than assume this operates without question at all times.

This extended introduction is meant to make sense of this controversy through a literature review. By doing this, this paper can make a more focused attempt at the task at hand, which is to provide information on current situation; issues and trends; consequences of inaction; current initiatives; stakeholders and the way ahead. However, without looking into recent theoretical advances and empirical evidence, there is a fear that the paper would go on obviously, needlessly and fearlessly to highlighting a completely wrong set of issues and prescriptions.

1.1. A Review of Literature

1.1.1. Poverty and Environment (with Population) Linkages

There has been considerable theoretical and empirical research on the various aspects of the poverty-environment nexus. Several papers have contributed to a better understanding of poverty-environment relationships (see, for example, Tim Forsyth et al, 1998; Eckbom and Böjör, 1999; and Jodha, 1998). We will use all of these, and other papers, to arrive at a better understanding of this well-known nexus. Essentially, Eckbom and Bojo (1999) have contributed to this debate by breaking down the explicit and implicit hypotheses in the literature to its component parts. These hypotheses are namely:

H1: Poor people are agents of environmental degradation

H2: Poor people are the main victims of environmental degradation

H3: Incomplete property rights reinforce the vicious poverty-environment interaction

H4: Population growth causes both poverty and environmental degradation

H5: Higher per capita income increases environmental pressure

With respect to H1, Dasgupta (1997) challenges this argument that the poor degrade their environmental resource base because poverty forces them to discount future incomes at unusually high rates (see Bardhan 1996). Dasgupta does not find much empirical support for this argument, and infers that this should apply to the poor in the past as well. However, evidence suggests that many poor people and societies have been able to generate remarkably stable and resilient institutions for coping with the income variability that being poor implies (Dasgupta 1997; Ostrom 1990; Swanson 1995). Dasgupta instead highlights that it is usually institutional failures in the form of deficient agricultural policy and poor people's property rights, and breakdown of community management of local resource base, which are the root causes of environmental degradation. DfID, et al, also highlight the fact that because of the much lower level of consumption and production of the poor means that they probably tread the lightest on this plant (2002).

With respect to H2, there is overwhelming supporting this hypothesis. Indeed Singsore and MchGranahan (1993, p. 33) capture the essence of this by stating that "environmental risks go hand-in-hand with socio-economic deprivation". This hypothesis includes such issues as poor people are more vulnerable to loss of biological resources; extreme environmental stress can force the poorest to migrate; inequality reinforces environmental pressure; and government policies can create or reinforce a vicious cycle of poverty-environment interaction.

With respect to H3, there is also empirical evidence that supports the hypothesis that tenure security is correlated with the quality of environmental management (Saxena, 1988; Hoy and Jimenez, 1996; Southgate, Sierra and Brown, 1989). However, there is a need to exercise extreme caution with respect to policy prescriptions. The issue is not about the privatisation of rights, rather as is it about community rights to manage common property resources (Dasgupta, 1997; Ostrom, 1990; Forsyth, et al, 1998). Literature suggests that privatisation of common property resources works to exacerbate inequalities and hence degradation (Dasgupta, 1997).

H4 is probably the most contentious of these issues. The origins of the population growth thesis detrimental to the environment began with Malthus. Malthus basically postulated that population growth will tend to rise exponentially, while food production will tend to rise linearly. The net result of his analysis is that population growth will eventually outstrip the supply of food resulting in famines, deprivation and chaos. A basic policy proposal is to limit population growth. Mink (1993) for example, argues that because of the poor living environment, and hence, lower productivity provides the incentives to raise large families. This, he argues, would contribute to pauperism in an adverse, dynamic pattern. However others (such as Prakash 1997) while recognising that growing population does exert pressure on productive lands and resources, it is not necessarily the case that population causes the damage. The complex of locally-specific, social, economic, environmental and governance circumstances in which increasing population takes place, which in turn can be strongly influenced by external policy and institutional factors, are usually the driving forces behind poverty-environment interactions (DfID, et al, 2002). In fact, there is much evidence highlighting, for example, that increasing population growth has led to the rehabilitation and profitability of degraded, unproductive lands (Tiffen et al., 1994). Moreover, research in the middle hills of Nepal has shown that farmers adapt organisational and land management practices to reduce the impact of population growth and environmental change, such as by using local landslides to increase soil fertility (Ives and Messerli, 1989). A simple question comes to mind: would environment cease to be degraded if population growth is checked? Or in fact would environment cease to be degraded if poverty is reduced or eliminated? We will explore both of these further below.

Finally H5 is presented as a counter-hypothesis to H1 in that it looks at the relationship, at the macro-level, between environmental degradation in poor versus rich economies. While it is clearly recognised that some environmental problems decline with rising incomes such as sulphur dioxide emissions, others such as CO₂ emissions and municipal waste per capita increase. Hence, the idea that economic growth in and of itself will lead to environmental improvement is not based on sound empirical evidence. The reason for decline in some problems is more often due to policy and institutional response than rising incomes (Ekbom and Bojo, 1999).

The key point here is that there instead of seeing the poor as agents of environmental degradation, or even the high levels of consumption of well-off individuals in developing and developed countries causing degradation, it may be more critical to ask what are the shortcomings of our economic and social systems that fail to take into account the tremendous social costs of degradation. This will lead to an assessment of the principal causes of environmental degradation such as market, institutional and policy failures. Finally, as the literature suggests, the poor are more often than not victims of environmental degradation.

1.1.2. New Thinking on Poverty

The above advances in theoretical and empirical research have come in step with new thinking on poverty. This section looks at how a traditional conception of poverty based on income and consumption are insufficient, especially in lieu of the poverty-environment interactions.

Sen (1981) has identified two essential questions regarding poverty: Who are the poor? And at what level is poverty defined? Conventional definitions of poverty have focused on income or consumption measures, which are thought to be a true and objective measure of poverty, and hence, subject to measurement. However, both income and consumption based definitions of poverty have been widely criticised for not capturing all of the elements of poverty. For one thing, there is a growing controversy whether income should be assessed in terms of flow (e.g. sale of agricultural products) or assets (such as land that may be rented or used as collateral on loans) (Reardon and Vosti, 1995). Second, both measurements do not include consumption from state provided commodities (health, education, etc.) or common property resources (forests, rangelands, etc.). Third, these measures do not contain information about the distribution of income within the household, for example, how women fare in this measurement. Fourth, access to income, for example, does not necessarily indicate whether people have access to common public services: clean water, sanitation, education, and health. These have led to the adoption of the basic needs and quality of life indicators, which are more robust. However, these too have come under criticism as they do not capture all of the manifestations of poverty, and tend to focus on inputs rather than the processes and outcomes (Banuri and Khan, 2001).

In an effort to address these various shortcomings, another assessment methodology known as the Sustainable Livelihoods (SL) framework has been developed. The SL framework takes a broad-based approach to assessing deprivation, and in particular, emphasises the importance of vulnerability and powerlessness. It highlights net asset position rather than flows of income, and shocks (short-term impacts) rather than stresses (longer-term threats to income) (Chambers, 1983).

It is such broader conceptions of livelihoods and well being that tend to emerge from self-assessments, such as participatory poverty assessments undertaken recently (see Asian Development Bank's Pakistan Poverty Assessment). The degree to which people draw on different criteria, as oppose to the so-called income measurement, can be striking (see Jodha, 1991; ADB, 2002). Examples from public resources and common property resources are provided above. What is of significance in this ADB assessment is the inclusion of environmental goods and services as well as entitlements to them, which conventional definitions of poverty overlook.

Following the SL framework, and in relation to this paper, we define poverty in terms of vulnerability or what makes the poor vulnerable. In general, poverty has been more appropriately defined to include income and non-income dimensions of deprivation – including lack of income and other material means; lack of access to basic social services such as education, health and safe water; lack of personal security; and lack of empowerment to participate in the political process and in decisions that influence one's life (Dfid, 2002).

1.1.3. New Thinking on Environment

In parallel with the development of new approaches to the issue of poverty, there has also been a corresponding change in the way in which environmental issues are viewed. Many of the environmental problems, which once played a central role in

the conventional 'vicious downward spiral' paradigm, are now being reassessed. Long-standing ecological concepts - such as natural vegetation climax and carrying capacity - are increasingly being challenged in the light of more recent research in the natural sciences.

Among the new concepts which are beginning to emerge are those which highlight non-equilibrium perspectives and the importance of variability over space and time. The concept of carrying capacity - which simply refers to the maximum population that can be sustained in a given environment (singular) - has also been called into question. The concept is problematic because it simplistically focuses on a single number, and because humans are dependent on multiple environments (plural) in complex ways. It has been argued that the term is "meaningless because the consequences of both human innovation and biological evolution are inherently unknowable" (Arrow et al., 1995).

This notion looks beyond the role of diversity of biological resources in existing ecosystem function and points to the role that diversity plays in helping ecosystems 'bounce back' in the face of shocks or stresses. This is the diversity-resilience linkage. The idea is that ecosystems come under threat from various shocks and stresses, for example climate change. Systems that are more diverse, it is believed, have more capability to respond to such shocks, whereas those with low diversity are more likely to 'collapse' and not recover (Holling et al., 1994).

In many ways this is familiar in a social and economic context (see also Box 2) - someone saving for the future would adopt a portfolio of assets ranging from cash with no rate of return to long-term investments. The idea of having a portfolio is to spread risk so that events that threaten one asset are unlikely to threaten other assets. A diverse portfolio is therefore like a diverse array of species. Diversification of crops in farming adopts exactly the same idea and farmers may diversify even though it may reduce overall productivity. The relevant 'shocks' in this context include local and global climatic change, but also cycles of pest invasions. There is evidence that, while the 'green revolution' has raised crop productivity substantially, to the benefit of human food supplies, it has also resulted in increased variability of output over time (Anderson and Hazell, 1989). More diverse systems may also be more resistance to species invasions (Chapin et al, 2000). The diversity-resilience linkage gives rise to the notion of an insurance value of diversity. What is being insured against with more diverse systems is the risk that the whole system may collapse. More strictly, since risk tends to refer to contexts where probabilities of stress and shocks are known, the insurance is against uncertainty, i.e. a context where risks often are not known in any actuarial sense (Perrings, 1995). Overall, then, diversity also appears to have a strong role in conserving ecosystem functions in the context of external stresses and shocks from climate change to pests and exotic species invasions.

New thinking on the environment is also taken up in the social sciences so that old concepts of an aggregate environment to which 'population' and 'society' relate are challenged by new ideas such as socially-differentiated people use and value elements/aspects of environment in different ways, and may define differently what is meant by degradation.

1.1.4. Access and Entitlements

As mentioned above, the genesis of the population-environment nexus is traced to Malthus, who in the late 1700s suggested that population growth, will rise exponentially whereas food production tends to rise in a linear fashion. The net result of this is that population growth would eventually outstrip any possible rise in food production, which means impoverishment, famines and calamity for humans. This argument, in more recent times, has been updated by Neo-Malthusians to encompass all resources (see Findlay, 1995).

Box 1: New Thinking: Population and Poverty

For Neo-Malthusian the issue was straightforward: rapid population growth is a direct cause of poverty, and hence, malnutrition and hunger (see, for example, paper on Gender). The solution to this was equally simple: invest in family planning (alone) to reduce poverty. However, recent research has shown that misguided agricultural and trade policies and poor food distribution (and hence entitlements to food) may be the root causes of hunger and malnutrition, whereas rapid population magnifies bad policies (Merrick, 2002).

Research, at the global scale, has however shown that the Malthus analysis of reduced food availability cannot be concluded from data, as in the areas where the majority of people live still experience rising per capita food production. Thus the population-food scarcity issues require greater elaboration. Rather it is the population-poverty nexus, which remains critical for many parts of the world (see Box 1). This has less to do with simple demographics than with the distribution of consumption and wealth. Social scientist have long recognised that the arguments concerning famines as an outcome of population growth are specious.

Amartya Sen (1981) has been instrumental in highlighting that the issue is about access to food, in contrast to its production, as the most important explanatory variable in food security and resilience of populations. Sen goes on to argue that entitlements are actual and potential bundles of commodities which individuals can access and that most famines are caused by circumstances of entitlements failure caused by human political action. It is therefore fittingly pointed out that the debate has to be concerned with the underlying vulnerability of societies to the poverty and resources issue in the context of population pressure.

More recently, authors such as Leach, et al (1997a,b) have adapted Sen's entitlements approach. This approach entitled environmental entitlements similarly shifts the emphasis from questions of resource scarcity to those of access, control and management. One of the key aspects of this approach is that it looks at the role that formal and informal institutions play in shaping people's resource endowments and entitlements, and hence mediating people-environment relations, so that any relationship between poverty and environment is indirect (Leach, et al, 1997a,b).

1.1.5. Vulnerability, Self-sufficiency and Resilience

It is important to recognise, in lieu of the entitlements approach, that it is social groups and individuals who are vulnerable to changes in their socio-economic and environmental circumstances, while adaptation to such changes provides

opportunities through diversification or migration (see Adger 1999). Vulnerability is a measure of the enforced exposure to critical stress, or shock, combined with the restricted capacity to cope. It is important to note that vulnerability is a function of powerlessness: it is created as people face phenomena beyond their control, and, at times, their understanding. Resilience is defined in one of two ways: the ability to withstand change or the capacity to restore and replenish following some externally imposed shock. Self-sufficiency is a measure of confidence in one's ability or judgement however, it should not be seen as a disconnection with everyone else (Banuri and Khan, 2001).

1.1.6. Conclusion

To summarise, the review of literature has demonstrated that poor people instead of being agents are more often than not victims of environmental degradation. But this should not let us fall into trap of seeing the poor as passive. As Box 2, and the last section on sustainable livelihoods, demonstrate that poor people know their situation and know how to cope. In fact, research using the sustainable livelihoods approach shows cases of sustainable natural resource management and livelihood outcomes, "where people access and use resources as part of their overall livelihood strategy and adapt to the conditions created by macro policy and political frameworks". Moreover, this approach shows "ways in which local people reverse patterns of degradation despite less than perfect policy and legal conditions (see wb1n0018.worldbank.org/ESSD/NRMTG). So, as oppose to conventional thinking, which looks to alleviate poverty as a prerequisite to environmental management, we instead, propose the joint pursuit of environmental management and poverty alleviation. Hence, there are potential win-win scenarios to be explored. We have also shown that conventional definitions of both poverty and environment are too narrow, and need to be assessed in a wider spectrum of approaches and opinions. Environment does matter to people living in poverty, and its degradation as evidence suggests impacts the poor more adversely.

In this paper, therefore, we are exploring the poverty and environment links where perhaps population pressure plays an important by magnifying market, institutional, policy and even governance failure (see below). But we do recognise in the process of writing this paper the danger of crunching livelihoods into agricultural and natural resource based strategies, as the we are aware that in the process of composing a livelihood may entail a wider conception of the resources people need to access. This, as Bebbington (1997) mentions is "perhaps especially in the context where peoples' livelihoods shift from being directly based on natural resources, to livelihoods based on a range of assets, income sources and product and labour markets. An attempt will be made to look into the wider conceptions of resources (see also Box 2).

Finally, as has been explored above, poverty can be most closely termed vulnerability. Poor are vulnerable to environmental degradation in at least three ways, namely livelihoods, health and natural hazards. In lieu of the sustainable livelihoods approach and the definition of poverty, the aim of the policy therefore should be to help the poor cope with vulnerabilities. This implies significant role of participation, empowerment and local-level decision making. It also brings out the role of local coping and adaptive strategies and local systems of knowledge as the

basis of support to bolster poor people's confidence in their own ability and judgement. We now move on to look at the current status of population, poverty and environment in Northern Areas.

Box 2: An Example

Using a Northern Areas household and myself as examples, we want to illustrate the essence of the discussions so far on vulnerability, resilience and self-sufficiency. I, as an individual, strategise to develop a set of endowments of assets and resources within a certain context, which is reflective of locally specific as well as national and global factors. These assets include, for example, human capital (foreign degrees), physical capital (car and equipment), financial capital (stocks, bonds, bank accounts, employment), natural capital (property) and social capital (the social networks I take part in). Together these assets contribute to self-sufficiency, resilience and empowerment in a dynamic sense. By holding a diverse portfolio of assets, I spread the risk against shocks that may threaten one or more of my assets. So, for example, if tomorrow I find myself out of a job I can use my financial capital to absorb the shock and by using my human and social capital I can overcome the long-term impacts of this shock. With the presence of market, state and civil society institutions means that I can access resources from different spheres (such as commodities, jobs, state provided services, legal rights, gifts and exchange). Hence, my endowments entitle me to access resources from different spheres, and contribute to my conception of livelihood security.

A Northern Areas farmer living in a relatively inaccessible, fragile and marginal mountain area, his strategy to develop a set of endowment of assets and resources would be different and governed by locally specific as well as national and global factors. If market and state institutions are generally meagre, a bulk of the strategy may focus on building collective institutions (social capital). Hence, the individual and collective elements will tend to overlap more so. With an endowment of land, a NA farmer may choose to diversify farming (e.g. grow grain crops, vegetables and fruit trees) even though it may reduce overall productivity but supports ecosystem services. This strategy would be supplemented by a local system of knowledge (human capital) to see, for example, what crops work best and why. So if one crop fails, this shock can be absorbed by the availability of other crops. Moreover, by building social capital an household's welfare may be supplemented by the availability of food in the community in the time of crisis. The farmer would also be dependent on common property resources such as forests, rangelands and water. Collective institutions (of the poor) would also be necessitated to access, control and manage common property resources because of collective benefits to livelihoods and collective costs to livelihoods such as landslides. In the literature, these are referred to as informal institutions that set the norms and rules for governing local natural resource management (Forsyth, et al, 1998)

A major question that arises is what are the implications for livelihoods and common property natural resources if, for example, the state supersedes local institutions and imposes the norms and rules for governing access, control and management to these resources?

2. PROFILE OF POPULATION, POVERTY AND ENVIRONMENT IN THE NAs

Northern Areas (NA) of Pakistan are indeed unique and majestic sites. NA are world renowned for its prominent mountains, enormous glaciers, glorious rivers and fabulous valleys. They also represent one of the few places in the world where one can find such concentration of high mountains as the landscape is dominated by some of the world's highest mountain peaks including 5 peaks over 8,000 m. NA are also the site for the convergence of three of the world's great mountain ranges, namely, the Himalayas, Karakoram and Hindu Kush. It is important to note the environmental context of the NAs that geologists point out, namely that these mountains are young and still growing. Craggy peaks, cliffs and steep slopes characterise the topography of the area. Aside from Skardu, the mountain valleys are usually narrow, deep and steep in appearance. These valleys are sites for pretty much all of the population as well as most of the available arable land in NA. The high mountains bar the monsoon rains to reach in NA. As a result most of the valleys of NA receive little rainfall and are characterised by a desert-like condition. Average rainfall is under 200 mm, and hence, agricultural activities are dependent on the supply of irrigation water. The areas above 4,000 m and above are sites for snowfall. The NA have the highest concentration of glaciers after the Polar Regions. Some of the longest glaciers of the world are found in these mountain ranges, for example, Siachin is 78 km long.

2.1. Population of Northern Areas

Table 2.1 gives a breakdown of population in different Districts and Tehsils in the Northern Areas. According to Population Census Organisation the total population of NA in 1998 was 870,347 with urban population being 122,324 or 14 percent and rural population being 748,023 or 86 percent of the total. The population growth rate¹ was estimated to be 2.7 percent, as compared to 2.6 percent nationally. Assuming this population growth rate to be constant (and ignoring out-migration²), the current population of NA should be 968,220 with 504,187 males and 464,033 females. This would make population density around 13.35 persons/Km, whereas in 1998, the national average was 166 persons/Km. If we eliminate 48,100 Km (see Table 2.6 Sr. 1 or about 66 percent of the area) because these are considered inhabitable areas, population density would now reach about 40 persons/Km still far below the national average.

There is lack of dis-aggregated data, or we have not been able to access it, to furnish the real population structure for NA. Rather we use the dis-aggregated data from 2 districts (namely Gilgit and Ghizar) and extrapolate the Population Pyramid for the entire NA. Using the Figure, we can deduce that even if the NA birth rate were

1. This is defined as "the number of persons added to (or subtracted from) a population in a year due to natural increase and net migration expressed as a percentage of the population at the beginning of the time period (PPA, 2002)".
2. However, in lieu of high rates of out-migration the figure would be lower.

Table 2.1: Population of Northern Areas (1998)						
District	Tehsil	Population				
		Urban	Rural	Male	Female	Total
Gilgit	TOTAL	56,701	186,623	128,028	115,296	243,324
	Gilgit	56,701	88,571	77,359	67,913	145,272
	Aliabad	0	32,219	16,404	15,815	32,219
	Gojal	0	14,446	7,444	7,002	14,446
	Nagar-I	0	28,825	15,347	13,478	28,825
	Nagar-II	0	22,562	11,474	11,088	22,562
Ghizar	TOTAL	10,142	110,076	59,248	60,970	120,218
	Punial	10,142	27,631	18,173	19,600	37,773
	Ishkoman	0	18,406	9,206	9,200	18,406
	Gupis	0	29,648	14,793	14,855	29,648
	Yasin	0	34,391	17,076	17,315	34,391
Ghanche	TOTAL	12,883	75,483	45,585	42,781	88,366
	Khaplu	12,883	51,464	32,831	31,516	64,347
	Mashabrum	0	24,019	12,754	11,265	24,019
Baltistan	TOTAL	26,023	188,825	114,917	99,931	214,848
	Skardu	26,023	55,215	44,000	37,238	81,238
	Rondu	0	34,375	17,964	16,411	34,375
	Gultari	0	11,966	6,688	5,278	11,966
	Shigar	0	45,322	23,881	21,441	45,322
	Kharmang	0	41,947	22,384	19,563	41,947
Diamir	TOTAL	16,575	187,016	105,443	98,148	203,591
	Astore	0	71,666	37,603	34,063	71,666
	Chilas	16,575	56,157	37,575	35,157	72,732
	Darel/Tangir	0	59,193	30,265	28,928	59,193

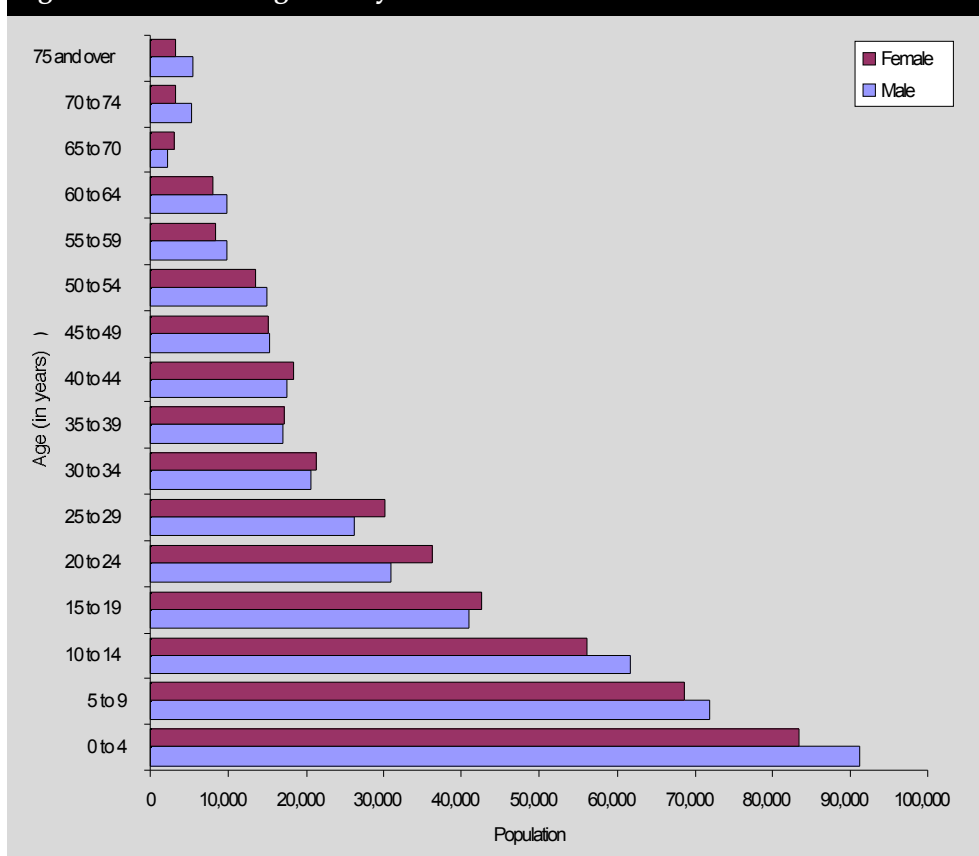
Source: Population Census Organization, 1998. Population and Housing Census of Northern Areas 1998. Islamabad: PCO, Government of Pakistan.

immediately reduced to replacement level, the demographic momentum of the population will still result in more than 75 percent increase in NA population over the next couple of decades reaching about 1.7 million inhabitants. However, after that the population, on the assumption that growth continues at a replacement level, would stabilise a few decades onwards. The concentration at the bottom of the Figure is like a wave pushing up and necessitating population increase.

The figures for NA are striking such as out of the total female population roughly 40 percent is of reproductive age, while nearly 50 percent of the population is under the age of 15. The interesting issue to note here is that even if the population grows

at present rate, it will double itself by 2024 (compare with replacement rates). Hence, population growth rate now and in the future can be lowered, however, the doubling of the population is inevitable. The crucial aspect to be aware of in this is that it is the structure of populations, number of individuals of childbearing age and total fertility, which are the key to future population growth.

Figure 1: Estimated Age-Sex Pyramid of the Northern Areas³



2.2. Poverty in Northern Areas

Data on the incidence of poverty in the NA has been difficult to locate. The only figure available for Northern Areas with respect to poverty is that in 1998 it was 28% based on the calorie head count with a per capita income of NA being PKR 7,500. At the national level, poverty level, in rural areas, was reported to be 31 percent in 1998 and per capital income of PKR 18,901.

What we have been to locate is some figures that show a general trend in one of the districts of the NA. For example, Table 2.2 shows that Gilgit, as a district, has progressed in per capita income from 46 percent in 1982-83 to 68 percent in 1997-98 of proportion of Pakistan per capita income. More strikingly, in Gilgit, the poverty level was lower (23 percent) as compared to the national level of 31

3. The Age-Sex Pyramid for the Northern Areas is based upon estimated population, extrapolated from population of two districts, i.e. Gilgit and Ghizar. Age-Sex data is not available for rest of the districts.

percent (AKRSP, 2000). Moreover, the overall poverty level of 28 percent in NA is also lower than the national figure. This is surprising because the perception of mountain areas is that they are the poorest regions in Pakistan. Papola (2002), however, points out that if one does take into account the higher caloric intake, clothing and permanent shelters required in mountain areas this may put some mountain people above the poverty line even though their basic needs have not been fulfilled. But be that as it may, there may be other factors for lower poverty levels in NA in 1998 (see below).

Table 2.2: Per Capita Income in Pakistan and Gilgit, 1982-97

	Pakistan			Gilgit		
	1982-83	1990-91	1997-98	1982-83	1990-91	1997-98
Per capita income (Rs.)	4,131	9,170	18,901	1,905	5,628	12,853
Proportion of Pakistan per capita income	-	-	-	46	61.3	68
Poverty Level	-	23.5%	31%	-	-	23%

Source: Bhatti, Tetlay, and Malik (1994) and AKRSP (2000).

In the absence of relevant data, we instead focus on the significant literature detailing the causes of poverty in mountain areas. Some of this literature is reflective of NA in general. The general assessment of this literature, such as Jodha (1992), is that any discussion of poverty and livelihoods in the mountain areas should be shaped by physical characteristics (mountain specificities) that also condition the socio-economic situation of people in these areas. These mountain specificities are respectively inaccessibility, fragility, marginality, diversity, comparative advantage and niche. The first three are the negative or downside of mountain specificities, while the last three are potential positives or promising aspects.

In terms of marginality, the NA are reflective of this fact in terms of most mountain households' dependency on farming as the main source of livelihood, as only 2 percent of the land area in NA is arable. Average landholdings per household is less than one hectare of land (AKRSP, 200) and this land is believed to be of limit productivity because of soil quality (Papola, 2002, see also Agriculture and Food Security Paper). In fact the Agriculture and Food Security paper points out that agricultural output level is even lower than the national average. For example, in 2000/01 wheat production was 1.8 T/hectare as compared to the national average of 1.9 T/hectare. Finally, other aspects, which encourage marginality, are altitude, aspect, access and irrigation. Two cereal crops are possible during the spring and summer growing season at lower altitudes. Whereas at higher altitudes the shorter growing season permits only one-grain crop followed by a short season crop. These aspects combined with limited landholdings mean that traditional means of farming will not increase food production and incomes.

Inaccessibility affects NA communities in three distinct ways. One, access to natural resources such as forests, land and water has become restricted. These resources, in more recent times, have come under the control of the government that restrict local

Box 3: Mountain Farming Systems and Livelihoods in Northern Areas

Although the altitude differences, temperature regimes, soils types and availability of water in the farming systems vary greatly in the mountain areas of Pakistan, livelihoods are specifically agro-pastoral. The Northern Areas comprise of high altitude mountains and almost desert like climatic conditions, where summers are hot and winters extremely cold. Despite adequate rainfall, timely availability of water and soil are the major constraints to agricultural production. The combined area under forest and agriculture is only a few percent of the total. This puts a huge constraint on the productive capacity of the resources, and land-holdings are typically very small, that is, fractions of acres.

Mountain farming systems are, however, quite complex. Irrigation water is used, where possible, to grow traditional varieties of wheat and maize. In addition, vegetables and fruits are also grown. The main crops not only provide grains but are also an important source of fodder. Herds are also sent to pastures in the summer and provide much needed nutrition in the long winters when fresh food is not available.

The Northern Areas encountered food deficiencies till the making of the Karakoram highway (KKH). The highway was built for defence purposes, and has greatly increased accessibility. The KKH traces the ancient "silk route" connecting Pakistan with China, its strategic defence and trade ally. Additional food in the shape of grains has increased the use of animals resulting in the over-grazing of pastures and decreasing the naturally occurring broad-leaved deciduous trees. But the Karakoram highway has also produced numerous avenues for the locals, and trade and tourism is a developing industry. Men can now move down country in the winter and return in harvest season. According to a survey published by AKRSP the external inflow contributes about twenty five percent of the average household income.

Source: Bhatti, Tetlay, and Malik (1994) and AKRSP (2000).

communities' use for various reasons (such as commercial and environmental). Two, inaccessibility entails that local communities lack access to markets, technologies and inputs. This puts a constraint on local communities to sell their products down country, access credit and technologies, which can improve their productivity. Finally because of physical isolation, low populations levels and perception amongst the government of low development value of NA, NA communities have not been able to influence national socio-economic and political processes in their favour.

Several of the background papers describe the NA' ecosystems as relatively unstable, nonresilient, and of low productivity. Fragility implies that because of topography, NA are more prone to natural hazards such as landslides and earthquakes, which makes local communities lives insecure and vulnerable. This often threatens the very means of survival and livelihood such as agricultural lands, crops, livestock and shelters. On average NA experience __ landslides per year and have been subjected to two earthquakes in 2002. (Perhaps you can put in a figure on how many people are affected from these over a period of a year).

These arguments taken together would imply that without overcoming these constraints it might not be possible to develop these areas in lieu of their potential positive aspects such as diversity, niche and human adaptation. However, research in and about Northern Areas has shown that the region in and of itself is

progressing economically and socially. Some factors behind this trend below demonstrate that the issues might be beyond mountain specificities:

- m Development of the Karakoram highway opening up access to and from NA
- m Evolving development paradigm that placed emphasis on the role of NGO and civil society
- m Space for NGOs and Donor community, in the context of a political vacuum created by state takeover, to work in NA especially to address flood catastrophes from deforestation and range degradation
- m Aga Khan Rural Support Programme and other donor projects addressing livelihood and conservation needs were initiated in Northern Areas
- m Better opportunities for collective effort in NA because of social capital and a less hierarchical social structure
- m GDP growth rate of 6.5% in the 1980s and 1990-92 making available livelihood options for NA communities such as employment down country, and hence, enabling remittances to NA

Table 2.3 has been included to show the significant role natural resources play in household incomes and livelihoods. The table demonstrates that, out of the three

Table 2.3: Household Income in Select Northern Areas 1990-91			
Region	Gilgit	Baltistan	Astore
Family size	9.5	7.9	9.1
Irrigated area (kanals ^a)	30.6	30.1	36.1
Crops (percent of area)	37.0	43.0	42.0
Irrigated pasture (percent of area)	63.0	57.0	58.0
Gross value produced (Rs.)			
Crops	16,235	9,402	8,137
Livestock	8,264	4,996	10,056
Fruits	2,962	3,089	346
Vegetables	2,413	1,862	528
Forestry	3,218	2,362	272
Poultry	914	386	269
Other	2,596	613	8,516 ^b
Gross farm income (GFI)	36,602	22,710	28,124
Farm cash costs	6,845	4,483	9,246
Net farm income	29,757	18,227	18,878
Other household income	23,712	10,351	20,916
Gross household income (GHI)	60,314	33,061	49,040
GFI as percent of GHI	61	69	57
GHI per capita	5,628	3,617	5,405

Source: World Bank (1996)

Notes: a. One kanal is approximately 0.05 ha.

b. Includes Rs. 5,739 for "grass" sales, which is 20 percent of farm income.

sample districts, 'farm income' constitutes roughly 60 percent of the household income. With the increase of out-migration (and the subsequent remittances to NA) as well as diversification of livelihood options, this figure may currently be lower. Nevertheless, the table speaks volumes for the role played by natural resources in the livelihoods of the NA' poor, as well as the nature of threat posed by natural resource degradation.

Livelihoods in NA are also crucially dependant on fuelwood from forests for cooking and heating, as supply of electricity is only available to 40 percent of the residents and there is no supply of natural gas. For energy security, whereby the lack of access to modern energy sources forces the poor to rely largely on fuelwood collection to meet their energy needs. According to the Energy paper, the monthly mean consumption of fuelwood by households was 755 kg during summer and 1,172 kg in the winter. There is no figure available on the sustainable supply of fuelwood provided by forests in NA. However, a HESS study has highlighted that nationally 51.29 million m³ of fuelwood is consumed per year whereas the estimated sustainable supply is only 6.51 million m³. This gap in supply has serious repercussions for forests and livelihoods in NA. It also has serious repercussions for the forest and energy policy of Pakistan, as fuelwood represent the key energy security for a majority of Pakistan's people.

Comprehensive health data has also been very difficult to locate for NA. Environmental degradation in terms of air pollution, water contamination and inadequate sanitation also has major implications on health and poverty. These manifest in terms of primary environmental diseases such as diarrhoea, hepatitis and malaria and diseases such as tuberculosis and chronic respiratory diseases where environmental degradation contributes significantly. Out of the estimated 2.7 million deaths each year from air pollution, 2.2 are from indoor air pollution, and 80 percent are the rural poor in developing countries. As mentioned, NA poor use fuelwood for cooking and the problem of indoor pollution is prevalent, and it is women who bear the brunt of this pollution by spending hours cooking over smoky fires. Figures for NA, in terms of prevalence of respiratory diseases were not available. In terms of water-related diseases such as cholera and diarrhoea, an estimated 3 million people a year die in developing countries the bulk of which are children under the age of five (Murray and Lopez, 1996). Data from the NA suggest that 42.6 percent of children under the age of 5 suffer from diarrhoea. Whereas Northern Areas Health Project Baseline Survey (2002) reported that 18 deaths were as a result of diarrhoea, the bulk of which were children under the age of 5. Table 2.4 summarises some available statistics for NA.

Table 2.5 has been created to show the educational status of NA. Education plays a vital role in poverty alleviation through the development of human capital. Moreover, it plays an important role in women's empowerment as well as reproductive choice. So while the literacy rate in NA is below the national level and still has a long way to progress, NA are beginning to catch up as the latest figure puts literacy level at 40 percent, with female literacy is now 25 percent. This progress is partly attributed to some of the factors highlighted above for economic progress as well as the role of the government and Aga Khan Education Services Pakistan. Both have contributed to making education accessible to NA communities.

Table 2.4: Health Statistics in Northern Areas

Major Health Indicators	Northern Areas 2000-01	Pakistan 2000-01
Life Expectancy (Years)		
Male	56.5 (for both)	61
Female		63
% Population with access to essential drugs	NA	65
Child Health		
Neo-natal Mortality Rate (per 1,000)	38	51
Post neo-natal Mortality Rate (per 1,000)		30.5
Infant Mortality Rate (per 1,000)	70	81.5
% of Children Age 12 – 23 Months that received full immunization	40	49
% of Children under 5 suffering from diarrhoea	42.8	NA
% of Children suffering from Respiratory Diseases	NA	NA
Family Planning		
Contraceptive Prevalence Rate	20	24
% unmet need for Family Planning	40	33
Women's Health		
Maternal Mortality Rate (Per 100,000)	5	4
Total Fertility Rate	6	4.8
Household Health		
Access to safe drinking water	40%	60%
Access to sanitation	18%	30%
Prevalence of water borne diseases (diarrhoea)	NA	NA
Prevalence of Respiratory diseases	NA	NA
Health Facilities and Personnel		
Basic Health Unit	16	5,171
Dispensaries	105	4,635
Hospitals	25	876
Persons Hospital Bed Ratio	1286	1,495
Doctor and Paramedics	140 and 1,033	91,800
Doctor Patient Ratio	6217	1,529
Doctor-Paramedic Patient Ratio	742	NA

Notes: NA– Not Available.

Sources: Northern Areas Health Project Baseline Survey (2002); Data provided on NAbY Pⅅ and SPDC (2001).

Table 2.5: Literacy Rates in the Northern Areas 1981-1998

Literacy Rates	Total	Male	Female
1981	14	17	3
1998	33	40	25

2.3. Environment of Northern Areas

The Northern Areas of Pakistan are located between 35-37 N and 72-75 E. The majority of the area is mountainous and covers over 72,496 square kilometres. Human settlements are on alluvial fans and terraces from 4,000 ft to 11,500 ft elevation on either side of the Indus and its tributaries where water is available for agriculture. The land comprises of exposed surface of various rock types. Most of the rocks are igneous and metamorphic. Geological erosion of these mountains is very active. The mountain soils are coarse loamy and sandy. Although some fine loamy and fine silty soils are also found.

Table 2.6: Summary of present land use in Northern Areas (000 ha)

Type of Land	Area	Percentage
Mountains/Lakes/Rivers/Glaciers	4,810	66
Forest	646	9
Rangeland	1,646	23
Cultivated Area	58	1
Cultivable Waste	90	1
Grand Total	7,250	100

Source: Department of Forest.

Table 2.6 above depicts the land classification of Northern Areas. In comparison to Pakistan as a whole, NA represent .7 percent of total population and yet comprise of 9 percent of the total land area. Only 2 percent of the area is termed 'cultivable area' whilst mountains, rivers, lakes and glaciers comprise 66 percent of the total land area. Forest and rangelands comprise 9 and 23 percent of land respectively. Hence, available land in the mountainous areas is used for arable farming, pasture or forestry. This is dependent on altitude, climate, physiography, soil moisture and socio-economic conditions. About 60 percent of the area is comprised of steep slopes having a very thin soil base. These slopes are very unstable and they support patchy natural vegetation. Large tracts between 900 to 3300 metres support coniferous forests. In elevations up to 1500 metres rangelands are grazed all year round. Small ruminants are grazed causing stress on the vegetative cover. Higher elevations between 1500 to 3000 metres are grazed only during summer, the pastoralists moving with the snowline.

The mountain environment of NA provides the poor with critical biological and natural resources to support livelihoods. This includes arable land and water for food and nourishment; pastures for livestock; and forests for fuelwood and shelters.

But this is only part of the picture; the poor also rely critically on ecosystems services to support livelihoods. These include:

- m Wild pollinators that are essential to food crops
- m Watershed protection and maintenance of hydrological regimes
- m Soil fertility through storage and cycling of nutrients
- m Waste sinks that breakdown pollutants

As we have mentioned that ecosystem resilience contributes to the well function of ecosystems. While some systems are less resilient and may suddenly collapse. In the absence of any such information on ecosystem resilience in NA we can highlight this as a crucial future research area.

The social environment of NA comprises of people, as mentioned in the Cultural Heritage and Tourism paper, who are descendents of the earliest Indo–Aryan tribes, which migrated from Trans-Pamir region between 2000 and 1500 BC, and settled in the northern mountain valleys – the present day Chitral and Northern Areas. Socio-economically the society, perhaps as dictated by the social and physical environment, is less hierarchical and has a long history of collective action and institutions.

3. ISSUES AND TRENDS

We have highlighted the fact that there is considerable empirical evidence that the poor suffer disproportionately from environmental degradation. We have not been able to locate any study examining poverty-environment links in NA. Indeed, as also suggested by Rasmussen and Parvez (2002), this would of course be a fertile area for future research. What we want to know is why the environment, especially considering its importance for social and economic development, tends to be pervasively degraded. Rather than just looking at poverty and population growth and come up with a mono-causal explanation of environmental degradation, it may be more useful to ask what kind of human actions cause degradation, and why. Here the set of incentives that individuals, communities and governments face is of key concern. Incentives are determined by a complex of economic, social and cultural factors. Economic factors focus on the incentives offered to each individual. If it turns out that people have the incentive to degrade the environment - because of the value and prices of natural resources, the nature of individual and collective property rights, the strength and effectiveness of institutions, expectations, about the future, the overall economic system, and the economic policies adopted by the government - then we should not be surprised if this actually happens.

Some conservationists are beginning to appreciate the importance of directly addressing the causes of environmental degradation as they have found, for instance, that unless attention is focused on the causes of biodiversity loss, mere protection of selected areas will no longer suffice. However, alternative initiatives in Pakistan have tended to focus on community-based natural resource management, which are themselves in nascent stages and based on oversimplified assumptions of poverty, livelihoods and communities. We will explore these aspects further below.

3.1. Causes of Environmental Degradation in Northern Areas

Economic incentives are shaped by a number of complementary factors. The first amongst these is valuation and pricing. A major reason for the degradation and depletion of biodiversity in particular and natural resources in general is the under-pricing and under-valuation of these resources. There are many reasons for such under-pricing. First, a decentralised market system has difficulties with the pricing of public goods or common property. A public good is one that is characterised by non-rivalness and non-excludibility - meaning that benefits to one person will not diminish the benefits to another, and that the good cannot be expropriated for use by a single individual or group. This is a classic case of **market failure**, similar to the case of national defence or clean air. In such cases, each individual will act as if the good was valueless, leading to less than optimal production, and more than optimal consumption, and hence to overexploitation

and destruction. At the macroeconomic level, for example, the system of national accounting does not take into consideration environmental values. While, at the local level, (because of market failure) environmental goods and services are under valued, with the net result that there is a lack of incentives for people to make rational choices. Whereas the NA's rural poor, who tend to rely heavily on ecosystem goods and services, may value environmental goods and services differently and perhaps dearly yet because of their poverty and lack of say in decision-making these values remain ignored.

As the paper on Forestry highlights, the exclusive focus on commercial logging - in and of itself a result of under-pricing and under-valuation - has led to a singular reliance on natural resource extraction from NA highlands at the cost of degrading the resource base. The main problem with this sort of thinking is that these resources are only thought of in terms of inputs into the economic system. Environmental economics perspective would alternatively suggest that much of the neglect of the NA mountain regions is because decision-makers often face informational constraints with regard to natural resources. The reason for these constraints emanates from a lack of knowledge of the Total Economic Value of these resources. Traditionally natural resources are seen in terms of their direct uses such as raw materials for human production and consumption (for example, timber value of natural forests, fisheries value of water ecosystems, etc.). What this informational constraint contributes to is a singular focus on commercial level extraction at the expense of other, less tangible, values or wider socio-economic development goals. In a situation of under valuing of the environment, conservation is difficult to justify in the face of other, often unsustainable, land and resource uses, which appear to yield greater and more immediate returns.

But what the broader benefit, through economic valuation reveals is that non-marketed values, ecological functions and non-use benefits are tremendous. Take, for example, the function of forests in maintaining soils in NA. However, when flash floods and landslides strike then the broader value of forests is realised – usually too late. This is just one example of the importance of the environment clearly demonstrating the high and wide-ranging economic costs associated with environmental loss or degradation of biodiversity and its components, which extend far beyond the loss of direct use values. What this accentuates is that natural resources make up far more than a static reserve. Instead they form a stock of natural capital, which if managed sustainably can yield in perpetuity a wide range of direct and indirect economic benefits to human populations.

It is not enough, however, that we demonstrate the broader benefits through environmental economic valuation, we have to capture these benefits. Capturing of these benefits is possible through many, new innovative economic and financial instruments, which can also be instrumental in poverty reduction. **It is this combination of demonstration and capture that can play a significant role in placing mountain development and environmental sustainability in the national perspective.**

Natural resources are also deliberately under-priced: **Policy Failure**. This is based on the presumption idea that such under-pricing will promote greater use and thus contribute to development. Here, macroeconomic policies have been instrumental in the predicament of natural resources.

- m While trends toward greater decentralisation, privatisation and devolution of the role of the public sector has instituted greater degree of local community participation of NA communities in natural resource use and management. Yet, on the one hand, much of the economic austerity (through decreasing government budgets and expenditure) and poverty that has accompanied economic liberalisation has had negative effects on the environment.
- m There is a general lack of internalisation of economic considerations in policies dealing with environment and natural resource sectors at the national level. This manifests in the neglect of costs and benefits, incentives and financial mechanisms to address the economic causes of environmental degradation, and hence, to forego maximising sustainable economic benefits.
- m Not recognising the total economic value of environmental resources has led sectoral economic policies, while explicitly relying on natural resources and the environment for raw materials and services provided, to under price the environment. For example, agricultural technologies aim at maximising yields without taking into account the loss of biodiversity and soil and water quality.
- m Particularly for the agricultural, water and energy sectors, the provision of subsidies provides perverse incentives and encourages overuse and hence environmental degradation.
- m Sectoral economic policies place a great deal of emphasis on formal sectors such as agriculture, energy, etc. with huge benefits accruing to them. However, the costs of conserving some of the natural resources that these sectors depend on accrue to a large number of NA local communities. This has grave distributional and external effects.
- m Lastly, the great deal of emphasis on the sectoral economic policies has come at the expense of natural resources. This in turn implies that the environment is ignored when government budgets are allocated. Surmise is to say that the poorly financed and under-staffed environment and resource sector comes up short of effective management of these resources. This leads to further degradation.

An important contributory factor to the under pricing of natural resources is the nature of property rights, especially collective property rights of local communities. So for example the Forestry and Livestock and Rangelands Papers point out that property rights to forests and rangelands are ambiguous. This is the crux of the problem: a situation when the rights of different stakeholders – the local community, forest contractors, the state forest department, and the individuals (who together constitute the community) – are ambiguous and contested. In such a situation, where the resource itself has de facto gone from being common property to open access, no one has a clear incentive to protect the resource; everyone takes whatever he or she can, and this generally means degradation. A major reason why forests are being degraded is because the rights of local communities are either unrecognised or are unenforceable. A second reason why property rights matter is that the holders of the rights should be able to manage them. Clearly, as the forestry and livestock and rangelands papers point out, the forest department in NA has not been up to task whereas the local communities have historically been in a better position to manage the rights and access to forests. Third, there is also an equity issue involved. Equitable distribution of rights can have greater political sustainability, and is an intrinsic part of the sustainable development ethos. Inequitable distribution can create conflict, undermine legitimacy, and lead to both economic and social costs. Finally, property rights should also address the question

of who has interest in conserving the resource. Forest departments have often been criticised for seeking to maximise revenues rather than conserve resources (or even to maximise the value of the resources). This, the forestry paper cites, is a major reason for forests degrading.

The link between pricing, property rights and environmental degradation should be clear now. Here the nature of institutions is a crucial issue. Institutions can be defined as 'regularised patterns of behaviour between individuals and groups in society' (Leach, 1997 a, b). For example, if timber prices are high, it can give an incentive both for cutting trees and planting trees. If peoples' property rights are secure, and if the protectionist institutions are strong, high timber prices will lead to more intensive afforestation efforts. On the other hand, if property rights are ambiguous, and if institutions are weak, the same prices will lead only to cutting trees and deforestation. Over the years, the NA have witnessed the gradual erosion of local, protectionist institutions as state institutions have taken over the role of access, control and management. These are instances of **institutional failure** to protect natural resource goods and services.

Another factor influencing incentives is uncertainty, especially in the context of valuation and property rights to the resource. Say, for example, that the forest is like any other economic asset and while the price of timber is high now but the owner is unsure what will happen the next day. This may give the owner the incentive to cut it down and put the money in the bank, if the owner feels that financial assets are more secure. Although this decision is economically rational from the owner's perspective its social and environmental impact will be neither rational nor desirable. Whereas the local communities in NA have tended to take a long-term view to such assets especially in lieu of their reliance and rights to the forests, the forest bureaucrats see a lower future value, and therefore prefer instantaneous revenues/benefits rather than higher delayed benefits.

3.1.1. Social Factors

It is also important to discuss social factors (such as gender, poverty, inequity and conflict) as they affect both incentives and environmental conservation. Gender is an issue in its own right and also in the context of poverty and inequitable access. In NA poor women have often played the role of the managers of biological resources, partly because of the fact that they tend to be affected more directly by their degradation. As a result, when economic and social arrangements begin to deprive women of access to or rights over natural resources, these resources begin to get degraded much faster.

Poverty can also affect conservation. But this has to be seen in the context of incentives to individuals. In a situation of uncertain futures (see example above) and inequitable access, the poor will have even more of an incentive to fulfil their immediate consumption needs rather than leave something for the future. However, as we have pointed out earlier, the poor can and do design stable and resilient institutions to protect the environment. Again, in lieu of environmental protection, institutions figure prominently. The idea is that if collective institutions exist, they are often capable of maintaining ecological protection especially amongst the poor. This is based on the idea or knowledge that restraint by one person will not be undermined by the actions of others.

Inequity is related to both gender and poverty. As we have mentioned earlier, access of the poor to biological resources has become more restricted over time, and this has also meant that women have been deprived of their customary rights. Similarly, as state institutions as well as customary regulation arrangements have broken down or become weaker, the poor have been increasingly excluded from access to environmental resources. On the other hand, again as pointed out by the Forestry paper, rich and powerful groups have often tended to expropriate the use of such resources irrespective of environmental, social or economic costs. Again, the most striking case is that of forests in NA, where forest officials, local landlords, and powerful timber contractors have colluded to decimate the forest resources while excluding local populations from all but a small fraction of the benefits.

When rights to resources are undefined or vaguely defined, this has enabled powerful groups to expropriate such rights. This has led to situations where legal rights are granted to powerful groups (or even to the government) in violation of customary rights or practices. This is a major reason for the inequitable access to biological resources. In such cases, no one has the incentive to protect the resource. In turn degradation also causes conflict by reducing the total amount available for distribution.

And then there is the issue of governance, which cuts across all of the factors mentioned above and compounds the vulnerability of the poor. At the general level in Pakistan, this has manifested itself in state institutions, which are heavily centralised and often in a state of decay. As a result, they are neither able to defend and protect the environment, nor can be subjected to popular control or accountability, and nor indeed able to obtain popular support in their functions. Some of the issues mentioned above such as inappropriate macroeconomic sectoral policies; neglect of the poverty-environment links that matter most to the poor; inadequate treatment of gender issues; corruption and accountability are a direct result of **governance failure**. These will be further highlighted below.

3.2. What makes NA Communities Vulnerable? Causes of Poverty in Northern Areas

NA communities can be subjected to shocks and stress that can be created by economic, governance, social and environmental causes, which makes the poor especially vulnerable. We have already highlighted above the role that physical characteristic of mountains, namely mountain specificities, can play in limiting and facilitating poverty alleviation in mountain areas. We now analyse how shocks from different sources contribute to ill being of NA communities:

3.2.1. Economic Causes

m Rasmussen and Parvez (2002) highlight that highland-lowland interactions and integration will lead to realisation of the interdependence of growth trends of both regions, and will increase resource flows, demand and market access to highland products, labour migration and livelihood diversification. Slowdown in national growth rates (to around 3%) in recent years has negatively impacted the poor in NA.

- m Because of the globalisation of the world economy, international shocks such as September 11 has negatively impacted NAs' tourist industry, and hence, the poor people's alternative incomes.
- m As mentioned above, the economic austerity (through decreasing government budgets and expenditure) has meant lower budget allocations for poverty alleviation and environment, and hence, has had negative effects on both. In 2001, 1.5 percent on poverty alleviation and 1 percent on emergent nature scheme was allocated from the annual development budget of NA.

3.2.2. Governance

- m Lack of strong pro-poor policies and institutional frameworks that reflect the realities and needs of the poor, especially those of mountain NA. However, although national planning frameworks such as the Interim Poverty Reduction Strategy Paper (IPRSP) take the guise of "pro-poor growth" but in reality the issues that matter to the poor, including poverty-environment linkages, are seriously deficient. For example, a World Bank survey (1996) established that natural resources contributed to 60 percent of NA household incomes.
- m Social and political exclusion of NA in the national decision-making social, economic and political issues as a direct result of inaccessibility, marginality and fragility. (See below on the lack of consultation of NA government and civil society in the IPRSP process).
- m Although greater degree of support to local natural resource management has been initiated. However, this has occurred as a result of NGOs and projects and not necessarily as a result of government policy. These initiatives include Mountain Areas Conservation Project, Himalayan Wildlife Project and AKRSP and these have meant that NA local communities play a role in managing natural resources and provision of environmental investments for rehabilitation.
- m Corruption and political instability leading to decreased and deteriorating investments, growth, public expenditure on basic entitlements, low efficiency in delivery of public services (including environmental management) and general public lack of confidence in state institutions, including the police, security and law and order. (ADB Pakistan Poverty Assessment cites that prior to 11 September 2001, investment, growth and public expenditure on basic entitlements achieved record lows (2002)).
- m At the national and regional NA levels the civil society does not have relevant forums and mechanisms from within to play an active role in creating a more favourable enabling environment to address poverty-environment issues that matter to the poor. Similarly, there is lack of effective participation of poor and marginalised NA communities in policy and planning processes at the regional level (see Paper on Governance).

3.2.3. Social

- m Although local communities have rights to resources such as rangelands, timber, and fuelwood, the management of these resources is in the hands of the Forest Department. Over time, access to these resources, especially for the poor, has become more restricted with increase in demands and decrease in supplies. In particular, as discussed in the Gender paper, women are facing increasing workloads from the collection of fuel wood because of emerging scarcities.
- m Literacy rates in NA, although rising, are still below the national average. This

is particularly the case for female literacy - at a dismal 25 percent - which stagnates local and regional development. According to Sen (1997) increased access to quality education means that not only do people produce more and more efficiently, but also play an instrumental role in social change.

3.2.4. Environmental

- m Annual rate of deforestation in Pakistan estimated to be around 3% and 45,500,500ha of area are affected by soil erosion (UNDP, 1998). If this is any reflection of the state of affairs in a fragile mountainous NA then the region is highly vulnerable to environmental disasters such as landslides and floods whose frequency has increased over the years because of deforestation and overgrazing. These threaten both the lives and livelihoods of the poor both now and in the future.
- m Deforestation, over-grazing and agriculture land degradation also affects the poor disproportionately partly because they are dependent on environmental resources for their livelihoods, and partly because they have lesser capacity to protect themselves. If 60 percent of household incomes in NA rely on natural resource contribution then it is safe to assume that the degradation of these resources will impact on local communities and especially the poor.
- m The NA rural poor rely on natural water sources such as streams for their washing and drinking. Although an estimated 40% of villages have access to safe drinking water, water related diseases such as diarrhoea affect 42% of children under the age of five. Moreover, diarrhoea contributes to 30 percent of hospital cases, and 14 percent of mortality rate (NHP, 2002).
- m As mentioned above, poor women and children are most susceptible to incidence of indoor air pollution. However data on respiratory diseases in NA through exposure to indoor air pollution is not available. At the same time, the increased time and energy spent in collecting biomass fuels contributes to the physical burden and ill health of women and children (see Paper on Gender). The net result of all this is increasing health costs as well as lower labour productivity.

3.2.5. How they all link up?

The complex of causes of poverty and environmental degradation present interesting interlinks that can be addressed simultaneously. Failure to do so will result in a tremendous waste of opportunity. Two examples about how the complex causes link up are as follows. First, take for example the statement in the IPRSP, that it is the quality of growth (i.e., pro-poor growth) that matters for poverty alleviation. This is indeed true. But if the IPRSP's definition of the quality of growth does not consider environmental aspects then the repercussions are dubious. That is, even if the growth process impacts positively on the poor but leads to degradation of the natural resource base and environmental pollution over time will the poor continue to be better off? Second, again take for example IPRSP statement that it is the lack of access to health facilities, which is a social determinant of poverty. However, by providing access to health facilities without addressing the root environmental causes of disease such as contaminated water and indoor air pollution leave the poor better off? Put in another way, without concentrating efforts to address the root causes of environmental degradation, and merely concentrating attention on corrective or curative actions, will make the poor no better off.



4. CONSEQUENCE OF INACTION

In the absence of the bulk of data, it is difficult to make assertions regarding the consequences of inaction in NA. But one issue does stand out more than others and certainly needs attention. We are referring to the fuelwood issue. As the Energy paper points out, only 40 percent of households in NA have access to electricity. This means that at least 60 percent of households require energy from alternative sources. At the national level, 61 percent in rural areas rely on fuelwood. The Energy paper also demonstrates that fuelwood comprises the bulk of energy requirements in NA, whereas kerosene and LPG are used but less intensively. This suggests that fuelwood provides the poor with access to energy outside of the commercial realm, and thus, is the main source of energy security in the country. The most crucial point here 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. Intuitively then the forests play a central role in energy security and perhaps this is the primary if not the exclusive function of forests. This would require altering the forest policy to ensure that forests supply this function on a sustainable basis. While the current energy policy has not demonstrated any alternative vision that could protect the forests without endangering energy security.

It is perhaps here that instances of a downward spiral may be observed. The symptoms are classics: lack of alternative energy supplies, increasing population pressure, the needs of the poor, and the nature of forest management and property rights could decimate forests and livelihoods in NA. However, this represents a key area of future research, as in the absence of any alternatives and locally-specific factors leaves the state of forests and poor people in a tenuous state.



5. CURRENT INITIATIVES

Current initiatives most relevant to the topic at hand are at both macro and micro-levels. Probably the most prominent one at the macro-level is the Interim Poverty Reduction Strategy Paper. Others at the national level include the Biodiversity Action Plan currently being implemented in the country. At the regional and micro levels there are a number of programmes and projects that can be discussed. Over all there are no initiatives, which are comprehensively and co-ordinately addressing the poverty-environment nexus in the Northern Areas. However, as mentioned earlier because of various factors, including a political vacuum for NGOs and Donors to operate in NA, a number of organisations have been active in promoting participatory conservation and development approaches in NA. The organizations include the Aga Khan Rural Support Programme (AKRSP), The World Conservation Union (IUCN), World Wide Fund for Nature (WWF) and Himalayan Wildlife Foundation (HWF). Both IUCN and WWF have played a significant role in introducing conservation of biodiversity with involvement of local communities and have been active in building capacity of the government agencies and rural communities in conservation and sustainable use of biodiversity. In addition, there are some local NGOs, CBOs and Welfare Committees, which have been active in conserving wildlife, fisheries and forest resources of this region.

5.1. Poverty Reduction Strategy Paper (PRSP)

In 2000, the Government of Pakistan initiated the process of developing the Interim Poverty Reduction Strategy Paper (IPRSP). This has represented a unique opportunity to develop an explicitly pro-poor policy framework in the form of a national strategy to reduce poverty. However, to date, the issue of poverty-environment links (such as improved natural resource management, better environmental health and disaster preparedness) that matter most to the poor have been largely overlooked. This is more of a reflection of lack of awareness on the importance of the environmental resource base as well as lack of capacity to integrate environment with poverty reduction. Hence, when it comes to integrating poverty-environment issues, the process is marred with indifference, incapacity and ignorance.

The process of consultations for the IPRSP has included 10 district workshops (out of 108 districts of Pakistan) organised and facilitated by government officials, and attended by government officials. Moreover, four provincial workshops were jointly organised by Planning Commission and the Asian Development Bank. None were organised in Northern Areas and Azad State of Jammu and Kashmir or Federally Administered Tribal Areas. This workshop was attended by government and selected civil society representatives – with no government or civil society representative from NA on the list of participants. Finally, one national workshop was held where the Planning Commission presented the IPRSP. Government, multi- and bi-lateral donors and selected civil society organizations attended the workshop.

Why has the NA not figured prominently in this important process and product, which is considered the defining policy framework for development planning in Pakistan over the next several years? We have already mentioned several key reasons above. However, a part of the reason for this lack of concern for the welfare of NAINhabitants and environments may be more due to informational constraints regarding the total economic value of the rich environmental resource base in the NA, and the importance of this resource to local and national livelihoods. However, there are a lack of studies analysing the poverty-environment links and more importantly, there are no studies demonstrating the economic value of NA resource base and its value to national development. Suffice it to say that without a clearer picture, NA do not stand to figure prominently in national development strategies and resource allocation.

5.2. The Biodiversity Action Plan (BAP)

In August 1999, the Pakistan Environmental Protection Council (PEPC) endorsed the Biodiversity Action Plan of Pakistan (BAP). The BAP provides information on the status of biodiversity of the country (including threatened species), identifies the causes of loss and the proposals of action to conserve biological diversity. All the thirteen articles of the CBD i.e. planning and policies, in situ and ex situ conservation, legislation, identification and monitoring sustainable use, incentive measures, research and training, environmental education and awareness, environmental impact assessment, access issues, information exchange and financial resources are covered in the BAP. It is an all-encompassing, comprehensive document covering a large number of biodiversity issues pertinent to Pakistan and contains the recommended plan of actions for conservation, sustainable use and benefit sharing arising from the use of biological diversity.

The BAP, during the process of implementation, can play a formidable role in addressing poverty-environment-biodiversity links. For example, the BAP aims to effectively mainstreaming biodiversity into other sectors, and more crucially seeks seriously deal with access issues. Nevertheless, its implementation, especially mainstreaming into other sectors, has remained tenuous for a variety of reasons, including lack of financial resources. Moreover, the BAP crucially lacks mechanisms for effective management of trade offs between conservation and development.

5.3. Sustainable Development and Livelihood Approaches

5.3.1. Aga Khan Rural Support Programme (AKRSP)

The Aga Khan Rural Support Programme is probably the only, most relevant and important initiative on conservation and development. The AKRSP has been working in northern Pakistan since 1982 with the objectives of involving rural communities in their development for sustainable increases in income and evolving a replicable model for small farmer development. Its approach to participatory rural development is based on three tried and tested principles: organisation and cooperative management, capital generation through regular savings and skill development at village level. AKRSP began its work in Gilgit district, then in the mid 1980s expanded to the Chitral and Baltistan regions. Later it moved into Astore

valley of Diامر district and now AKRSP operates in all six districts of northern Pakistan. AKRSP has so far organised more than 2,600 rural communities into village/women's organisations with 101,300 members, who generated Rs.210 million as their collective savings during 1994 and trained nearly 13,200 village level specialists in managerial and technical disciplines.

Within Pakistan, a number of rural support programmes are following the conceptual model evolved by AKRSP. The Agriculture Section of AKRSP led the process of integration in AKRSP's response to the issues of natural resource management at the village level. The current strategic focus is on appropriate interventions, which not only enhance food security within the region but also exploit comparative advantage niches. AKRSP has developed packages for fruit and vegetable production, marketing, seed potato production, fodder improvement and increased maize and wheat production.

More than 1,300 livestock specialists and 1,500 poultry specialists have been trained to provide services at village level. AKRSP has supplied 4.2 million plants, while VOs have planted 14 million plants from their own resources under the social forestry programme of AKRSP. It has developed a 'Women Catalysts in Environmental Change' package for the establishment of backyard fruit and forest nurseries. AKRSP has recently been given the blessing of the World Bank after 10 years in operation.

5.4. Conservation and Livelihood Approaches

While the initiatives highlighted the emergence of various innovative approaches in that they have move towards a more inclusive community-based conservation model, they are still in their nascent stages and are founded on a limited understanding of poverty, livelihoods and community. Moreover, these have been able to protect a proportion of land and water (and the associated biological resources and diversity); nevertheless management and opportunity costs remain prohibitive (see below).

Moreover, as we highlighted above due to lack of serious headway in implementing BAP, there is a lack enabling policy environment, and therefore, replicability and longer terms sustainability limited, with some of these initiatives only paying 'lip service' to sustainable livelihoods.

5.4.1. IUCN's Conservation Initiatives

IUCN Pakistan has been active in promoting environmental conservation in NA since 1986, first working with the AKRSP on introducing community forestry and later implementing field projects for biodiversity conservation in collaboration with NA Administration, AKRSP, Forest Department, WWF, HWWF, and local communities. Three of the IUCN's important initiatives are described here briefly:

5.4.1.1. Biodiversity Conservation Project

IUCN implemented a GEF/UNDP funded pilot project "Maintaining Biodiversity in Pakistan with Rural Community Development." between January 1995 and April 1999. The project was designed to demonstrate the Community Based Conservation

(CBC) approach for the conservation of renewable natural resources. The main objectives of this project were to: a) demonstrate how conservation of biodiversity can be enhanced by providing rural people with technical skills; b) illustrate how local institutions can manage wild species and their habitat for sustainable use; and c) assess the effectiveness of rural management of natural resources.

The pilot project was spread over 15 valleys in Northern Areas (NA) and North West Frontier Province (NWFP) of Pakistan covering more than 6700 km² of Karakoram, Hindu Kush, and Western Himalayan mountain ranges. It covered different ecological zones included permanent snowfields, alpine meadows and dry alpine habitats, dry temperate coniferous forests, alpine scrub, and moist alpine zones. The local communities involved in the project included 65 villages comprised of 5,800 households and 56,000 people. The major focus of the project remained on wildlife, though conservation of natural forests, medicinal plants, and introduction of ecotourism were also addressed where deemed appropriate.

The project was largely successful in promoting community-based conservation particularly in valleys where Village Conservation Committees (VCCs) were based on a single village. A number of factors contributed to this initial success including: (1) participatory and flexible approach adopted by the project, (2) working through the existing local institutions e.g. VOs (3) instituting local level conservation funds, (4) building local capacities, (5) devolving control over natural resources to VCCs, and (6) providing community-based economic incentives for conserving wild species e.g. trophy hunting. Moreover, regular interactions between the project staff and the VCCs helped build trust and provided a mean for dissemination of information to the villagers. Success of CBC project lies on stable local institutions; project, therefore, focused on building local-level capacity to a village-based conservation programme. This was important to enhance local people's skills, so that they can manage their own biological resources.

5.4.1.2. Mountain Areas Conservancy Project (MACP)

IUCN is currently implementing this GEF/UNDP and GoP funded project with total cost of US\$10.35 million over the period of seven years (1999-2006). This project is built upon successful implementation of the pilot project "Maintaining Biodiversity in Pakistan with Rural Community Development". The project covers important ecological landscapes of the Karakoram, Hindu Kush and Western - Himalayas mountain ranges in both NWFP and NA. In NA, it will cover two large conservancies—Gojal and Nanga Parbat. Collaborative partners of this project include NWFP Wildlife Department, NA Forest Department, WWF, AKRSP, and HWF. MACP is based on the promise that conservation of biodiversity is unlikely to be sustainable over the long term unless local communities are actively involved in the conservation activities. Therefore, the aim of the project is to mitigate threats to biodiversity and ensure its sustainable use through community-based conservation approach. The project has the seven broad objectives or outputs: 1) develop and strengthen capacity of the local communities to conserve biodiversity; 2) impart conservation values and provide mechanisms for sharing information on management of wild resources; 3) monitor effect of the project on biodiversity and socio-economic indicators; 4) assist communities in securing long term support for eco-development; 5) develop a knowledge base about the components of biodiversity; 6) assist government in policy and legislation reforms to support

participatory conservation; and 7) develop endowment funds to meet the on-going costs for conservancy management. The most important component of the project is to demonstrate sustainable uses of wild flora and fauna through community run demonstration projects. It is expected that if implemented successfully, this initiative will help in conserving many globally significant species of flora and fauna.

5.4.1.3. Northern Areas Conservation Strategy (NACS) Support Project

IUCN is also preparing the NASSD with funding from the SDC and NORAD. This project intends to develop a comprehensive conservation strategy for NA by focusing on enabling policies and legislations for the environment conservation, and strengthening the institutional capacity of the NA Administration to support environmental conservation and developmental issues.

5.4.2. WWF's Community-based Conservation Initiatives

WWF-Pakistan has been pioneer in introducing community-based wildlife conservation project starting from Bar Valley in 1991. Now it has expanded its work to 5 different valleys in NA with funding from WWF-UK, DFID, EU and other donors. One of its current projects is "Sustainable resource use and biodiversity conservation at key sites in NA. This 3 years project aims to conserve globally significant wildlife species through sustainable resource use in Bar, Karamar, Shinaki, Gulkin and Bulashbar valleys. These valleys provide habitat to Himalayan ibex, musk deer, snow leopard, flare-horned markhor, woolly flying squirrel, and brown bears. The project aims to conserve these species by improving socio-economic condition of the local communities. This broad-based project encourages the development of links and partnerships with other stakeholders in sectors like public health, environmental educations, ecotourism, social forestry, infrastructure development, institutional strengthening and even promotion of handicrafts (WWF 2000).

WWF has also been involved in creating awareness for conservation of snow leopard in NA. As part of its efforts for saving this species, it has held a training workshop on snow leopard survey techniques for the staff of NA Forestry Department, IUCN and WWF-Gilgit. It has also established a Conservation and Information Centre at Gilgit to promote conservation and environmental education activities and to provide training facility for the conservation workers. This organization was also instrumental in developing a Management Plan for the Khunjerab National Park and has played an active role in piloting community-based trophy hunting programme in NA.

5.4.3. Himalayan Wildlife Project (HWP)

This project aims at protecting biodiversity of Deosai Plains, particularly threatened Himalayan brown bear. Deosai Plateau is rich in biodiversity, especially plant and animal species adapted to high elevation. Due to its biodiversity significance, the area was declared a national park in 1995 and a management plan for protecting its ecological integrity was developed in 1998 under the HWP. The focus of this project is on strengthening management of Deosai National Park, conservation advocacy, education and awareness, and research on the flora and fauna of the park, particularly on ecology and management of Himalayan brown bear. The project

works very closely with NA Forestry Department, District Administration of Skardu, local communities, and the other conservation initiatives in the area e.g. MACP. The project had received funding from the GEF/UNDP small grants programme, WWF, and technical assistance from the US Fish and Wildlife Service, Kruger National Park, South Africa. More recently, it has received funds from NORAD for implementation of the management plan of the national park and for strengthening this initiative for conservation of biodiversity of this alpine region.

5.4.4. Khunjerab Village Organization (KVO)

Buffer Zone Project

A syndicate of 7 VOs in upper Gojal, KVO has been implementing a wildlife conservation and sustainable use project in the buffer zone of Khunjerab National Park. This has been a locally initiated and internally motivated project managed on self-help basis by the KVO since 1995. The local community has employed its own community guards, established wildlife check posts, and assessed local wildlife resources with the technical assistance of IUCN and WWF. First, KVO received some funding from the GEF/UNDP small grants programme and a donation from the President of Pakistan for the conservation activities. Later they generated their own funds through community-based trophy hunting programme. Under this programme, KVO receives 80% of the trophy hunting fee and 20 % goes to the government exchequer. Income from trophy hunting was a powerful incentive for the community to manage wildlife biodiversity. So far, the community has earned a considerable amount from both foreign and local hunters under the controlled hunting programme. The number of poaching incidents in the areas declined substantially and the impact of this initiative on the wildlife populations is positive. Recently, KVO has joined the MACP project under its Gojal conservancy and has planned number activities for conservation and sustainable use of biodiversity of the area, including establishing Valley Conservation Fund, fisheries resource management, wildlife viewing, ecotourism, and village level education and awareness programme. It is expected that these activities will have positive impact on the biodiversity of the area.

5.4.5. Community-based Fisheries Management in

Ghizer Valley

This was a joint initiative of the AKRSP and Fisheries Department, NA for the community-based management of wild fish stocks in Ghizer Valley. AKRSP has been working on this pilot initiative since 1997. The NA Administration has notified a policy for participatory management of fisheries resources. Under this policy, Terms of Partnership has been signed among the local community, AKRSP and NA Fisheries Department with specific role for the each partner for the implementation of the project. The main objectives of this initiative are to: 1) encourage village-based income generating activities; 2) conserve biodiversity of the area; 3) promote ecotourism; 4) generate employment opportunities; and 5) improve nutrition of the rural people. The first community to embrace this project was the people of Hundrap. As per terms of the partnership, the local community restricted access to Handrup Nullah and Hundrap Lake in 1998, started charging fee for angling, and banned all other forms of fishing. The community set their own management fee for anglers, Rs.25, Rs.100 and US\$5 per day for NA residents, Pakistani and foreigners respectively. The community to pay the community fish watchers as well as to meet

other socio-economic development needs of the community retains the management fee. The community is also authorised to collect the Government license fee, which is to be forwarded to the government treasury and is obliged to enforce the normal conditions of the NAFisheries Act, 1975. The initiative has been quite successful; the fish population has increased, and the local community has earned Rs.15,000/-, the community's share from the management fee (AKRSP/DFID 2000). The project is popular among the local communities and AKRSP wants to promote this programme to other parts of the Ghizer Valley. For this purpose, they have also negotiated a pilot project with IUCN to be funded under the NASSD project. Soon, six more communities will become part these collaborative efforts for conservation and sustainable use of fisheries resources. This new project also includes establishing local level conservation funds to be used by the local communities to support community fisheries management programme. It is expected that the success of this initiative would help in conservation of freshwater biodiversity in NA.

5.4.6. GEF/UNDP Small Grants Programme (SGP)

The SGP provides small grants of up to US\$50,000 to local NGOs and CBOs to implement small-scale projects in the GEF focal areas, including biodiversity. To date a number of grants have been provided to local NGO/CBOs working in NA for biodiversity conservation and developing alternative livelihood resources. One of the current projects under this programme is "Biodiversity conservation in sites of the unique habitat of the woolly flying squirrel in NA". This project aims to save the woolly flying squirrel from extinction by conserving its habitat and reducing human induced impacts on this endangered species by creating awareness about conservation, alternative income generating activities, and promoting fuel wood plantations in the valleys.

5.4.7. Establishment of District Conservation Committees

One of the important outcomes of the implementation of the Biodiversity Conservation Project was the establishment of the District Conservation Committees (DCCs) in all the five district of NA. This is the first time in the history of Pakistan that a common forum has been created at the district level, where community representative can voice their issues and participate in the decision making process. Though DCCs are in their infancy stage, these institutions could provide a great opportunity to address the biodiversity conservation issues at the local level. These DCCs could even be more effective, if some how they institutionalised under the new devolution of power system.

The purpose of these DCCs was to provide institutional and administrative backing to the village-based conservation programmes. The functions of the DCCs are to extend full support to local communities, coordinate implementation of the local level Biodiversity Conservation Plans among government agencies, NGOs and local communities. The DCCs offer an effective mechanism for linking government institutions and local communities, strengthening law enforcement, and monitoring implementation of the district level conservation programmes.

There is still long way to achieve sustainability in this initiative, but these DCCs are certainly a useful forum to address the biodiversity conservation and sustainable use issues at the local level. Under the new system of local governance, district

assemblies could select their own priorities for conservation of natural resources of the district. Therefore, there is need to build upon this initiative and strengthen these DCCs further.

5.4.8. Establishment of Valley Conservation Funds (VCFs)

The establishment of local level conservation funds was another innovation evolved during the implementation of the Biodiversity Conservation Project. The purpose of these endowment funds was to help local communities pay for the conservation costs. These funds are being operated under an agreement signed between the Valley Level Conservation Committees (VCCs). The main objectives of the VCFs are to: (1) provide a self-supporting revolving fund for village level conservation activities, (2) develop partnerships between the local communities and biodiversity conservation initiatives, and (3) create a sense of community ownership of the conservation programmes.

So far, about 10 VCFs have been established in NA. These funds are managed jointly by the VCCs and the conservation projects to guard against any misuse of funds. However, the decisions to use these funds rest with the communities. Initial response to the VCFs from the local communities has been encouraging and some communities have beefed up their VCFs to a reasonable level. For example, the people of Khyber have increased their VCF to more than Rs.500,000/-. The introduction of local level conservation funds provides a strong economic incentive for the local communities to develop self-supporting biodiversity conservation programmes at the village/valley levels. These funds serve as a catalyst to encourage local communities to participate and secure long-term benefits from conservation and sustainable use of biodiversity. This has been another useful initiative and there is need to promote this approach at much larger scale and link these funds with the conservancy level funds being established under the MACP.

5.4.9. Trans-boundary Efforts

WWF-Pakistan has been trying to initiate the trans-boundary conservation programme for the last several years. The purpose of this initiative is to establish an "International Peace Park" along the border areas of China and Pakistan for the protection of endangered snow leopard, Marco Polo Sheep and other elements of biodiversity of this high altitude region. The idea is to forage trans-boundary collaboration for the effective management of the Khunjerab National Park and Taxkorgan Nature Reserve complex. In this regard several meeting have been taking place, but concrete breakthrough has yet to be achieved. In December 2000, a delegation from NA Administration visited the Xinjiang Autonomous region and held meeting with the Chinese authorities for taking this initiative forward (WWF-2000). This is an important initiative and could provide an opportunity for NA to secure a joint investment from Pakistani and Chinese Governments for conservation of biological diversity in Khunjerab National Park and its adjacent areas.

5.4.10. Northern Areas Health Program Project

The Northern Health Program Project represents a promising initiative to improve the status of health, including environmental health, in NA. The project works to support the government's programs in Northern areas and Azad Jammu & Kashmir. It seeks to reduce infant and maternal mortality by about 30 percent over

a four-year period. Improved health status of the population will be based on achieving the following four objectives:

- m Improving quality and sustainability of primary health care, including preventive measures;
- m Increasing cost-effectiveness and coverage of government health and family planning services;
- m Strengthening the capacity of the health sector; and
- m Building institutional capacity.

The project will comprises of four main components:

- m Strengthening of community and non-governmental organisation participation;
- m Strengthening government health services;
- m Human resource development; and management and organisational development.

5.4.11. Social Action Program (SAP)

In spite of steady improvements the health indicators in Pakistan are very poor as compare to the countries at the same level of economic growth. The Alma-Ata conference in 1978 paved the way for the primary health care approach. The focus of health care (PHC) in Pakistan was primarily on tertiary and secondary health care that could only benefit 19% of the population. The PHC includes:

- m Promotion of foods and proper nutrition
- m Safe-water and basic sanitation
- m Immunization against major infectious diseases
- m Appropriate treatment of common diseases and injuries
- m Health education
- m Reproductive health and child health

Keeping this approach in mind the policy of SAP was to improve the quality of basic services, increasing community involvement and building gender equity. An important element of SAP was to bring grass root level changes in population welfare, water and sanitation and reproductive health, involving community workers e.g. LHWs and LHVs. This approach has been successfully adopted by Aga Khan Health Services in Northern Areas.

We have not been able to find an initiative which specifically deals with disaster preparedness. This is particularly odd since the region is infamous for many man-made and natural disasters such as floods and landslides.



6. STAKEHOLDERS

The subject of poverty and environment and the integration of conservation with development will necessitate that a broad range of stakeholders be involved in strategy development and implementation. The major stakeholders are rural communities, local institutions and CBOs, urban inhabitants, conservation and development organisations, public sector institutions including line departments and research institutions, and the global interest groups and institutions, who have indirect interest in poverty alleviation and environmental conservation in the NA. As we have seen from the causes of environmental degradation and poverty subsections that the scope of stakeholder involvement transgresses the local level and requires national and even global level involvement.

6.1. Local Level Stakeholders

Obviously the local communities and community organisations would be the primary stakeholders, As mentioned, natural capital represents a critical component of livelihoods especially for the various categories of rural NA inhabitants. The variety of biological resources in NA provides choices and options through diversification; help productivity enhancement and maintenance; act as insurance/risk management; strengthens resilience, helps manage pests and diseases, smoothens yield variability; and is a source of information and aesthetic qualities.

There are many CBOs and village organisations primarily due to the work of AKRSP. These include CBOs, Village Conservation Committees, Forest Committees, VOs, WOs, Welfare/Zaito Committees and local Jirgas in many valleys of NA. These collective institutions are often involved in local decision making for protection and use of natural resources, hence they have direct stake in conservation of natural resources and biodiversity in their respective areas. Some cluster organisations, like Khunjerab Village Organization and Shimshal Nature Trust, have been active in environmental conservation issues at much broader level.

6.2. Conservation and Developmental Organizations

Several organizations in the field of conservation and development are active in NA. These include AKRSP, IUCN-Pakistan, WWF-Pakistan, Himalayan Wildlife Project and Belour Advisory and Social Development Organization (BASDO). These organisations are important stakeholders as they are at times the primary supporters of conservation and development initiatives.

6.3. Public Sector Institutions in NA

There are several public-sector institutions that would have a stake in environmental conservation and sustainable development in NA. As the role these

institutions play in conservation and development has been outlined in many background papers, we will briefly name these below:

- m NA Planning and Development Department
- m Forest Department of NA
- m Agriculture Department
- m Livestock Department
- m Fisheries Department
- m Health Department
- m Population planning and services

6.4. Federal Government Institutions

At the Federal level several ministries have a stake in environmental conservation and development in NA. The most important ministry and government institution at the moment happens to be the Ministry of Finance and Planning Commission as they are jointly preparing the Poverty Reduction Strategy Paper. This document represents a key to providing an enabling national environment to address poverty and environment linkages in mountain areas. Below, again, we name these institutions as other papers have elaborated their stakes and roles:

- m Ministry of Finance and Economic Affairs
- m Planning Commission
- m Ministry of Environment, Local Government and Rural Development (MELGRD)
- m Ministry of Kashmir and Northern Areas Affairs
- m Ministry of Agriculture

6.5. Global Level Institutions

As the Biodiversity paper mentions, there are several international institutions with a stake in maintaining the state of biodiversity in NA. A number of international agencies and multilateral donors have been involved in biodiversity conservation activities in the region. There are similarly a number of international agencies with a stake in alleviating poverty in the NA: These organisations include:

- m International Fund for Agriculture Development
- m The World Bank
- m World Health Organisation
- m Global Environment Facility
- m United Nations Development Programme
- m European Union
- m NORAD
- m Department for International Development
- m Aga Khan Development Network

7. THE WAY AHEAD

In section 3, we have highlighted a complex set of causes of poverty and environmental degradation. This section, the way ahead, is meant as a way to address both simultaneously. Although the programmes (e.g., AKRSP) and projects (e.g., MACP) currently underway are integral part of a future strategy, we will not repeat these initiatives here. Key aspects of this strategy need to also consider the following policy and programme components at different levels:

7.1. Macro and Regional level Interventions

7.1.1. Governance Aspects – Enabling policies, legislation and institutions

- m Creating a favourable enabling environment by integrating poverty-environment issues in IPRSP and major national and regional development frameworks
- m Develop processes to integrate poverty-environment issues that matter to the poor into sectoral policies and plans
- m Develop more equitable decision-making mechanisms and participatory policy processes that ensure effective participation of the poor and marginalized groups
- m Incorporate gender related issues in IPRSP and major national and regional development frameworks
- m Develop tools and incentives that address market, policy and institutional failures and make conservation and/or sustainable use viable
- m The issue is not simply good governance rather what incentives can be developed for good governance and capacity strengthening at the regional levels
- m Develop laws and legislation to address access and property rights especially around protected areas and forests
- m Develop programmes for poverty-environment monitoring assessment

7.1.2. Economic Aspects

- m Pursue a development path, which is consistent with greater natural capital and human development - Improve quality of growth
- m Integrate poverty-environment issues in economic policy and decision-making
- m Develop national and regional accounting systems that reflect environmental values
- m Assess and reform subsidies that are environmentally-damaging and hurt the poor
- m Use direct regulation of activities, including bans, in order to protect the environment and the poor

7.2. Regional and Local Level Interventions

7.2.1. Governance Aspects

- m Strengthen the access of the poor to all types of resources including technology that is environmentally-sound and appropriate for NA
- m Support local community environmental management and control of resources by using community-based conservation project approaches such as MACP
- m Expand social protection to reduce environmental vulnerability of the poor. These could easily be handled by an NGO like AKRSP or the Khushal Pakistan Programme and would basically mean a form of an insurance programme to protect the poor against shocks and stress. NA Administration could also play an instrumental role by initiating a programme in risk reduction or disaster preparedness and post disaster response and relief efforts

7.2.2. Environmental and Economic Aspects – Pro-poor markets that bring value to environmentally-friendly practices and products

- m Promote high value, low impact, and other 'biodiversity-friendly' products. The case in point is the trophy hunting initiative carried out by MACP, which brings high returns but has low impact. Moreover, non-timber forest products such as medicinal plants have potentially large markets.
- m Promoting the business case and learning from rigorous best practice case studies. AKRSP is already engaged in enterprise development and marketing. These initiatives can be further expanded to environmentally-friendly practices and products. Moreover, the private sector can play an integral role in providing waste management, sanitation and wastewater treatment
- m Promoting partnerships and capacity building within small businesses that rely on maintenance of biodiversity (e.g. tourism etc.). There are a number of tour operators who profit from the maintenance of NA natural environment. Partnerships with these businesses can contribute significantly to employment and investment in the region
- m Tackle environmental degradation by addressing market, policy and institutional failures. Here economic valuation methods should be used to demonstrate the benefits of conservation and costs of degradation – a key tool in influencing decision-makers. However, capacity will need to be built in order that the government or other organisations can carry out these studies
- m Addressing the above mentioned failures should be in lieu of the ground realities, namely that environmental conservation will ultimately rest on the actions of local communities and land/resource users. Currently there are very few economic inducements for them to engage in conservation, and many economic disincentives to do so. In particular, bring positive economic and financial incentives into the ongoing conservation initiatives, assess their economic feasibility at the local level, and ensure that it is economically and financially worthwhile for all sectors of local communities (including the poorest) to engage in conservation.

7.2.3. Social Aspects – Protecting unique knowledge and developing and/or transferring relevant technologies

- m NA are considered the storehouse of biodiversity in Pakistan. It is crucial that commitment towards finding better intellectual property protection methods for traditional and indigenous knowledge and resources are developed, and fair and equitable benefits is derived from use of this knowledge
- m More Research and Development investment into diversity-friendly or reduced impact pro-poor harvesting and production systems

7.2.4. Educational Aspects – Improving awareness through education and communication

- m More effective promotion of environmental education and public relations in NA
- m Mainstreaming environmental education in teaching curricula
- m Continued lobbying of mainstream media to address biodiversity and livelihoods issues. NA media is already active in covering environmental and livelihood issues.

7.3. Adopt Sustainable Livelihoods Approach

In lieu of the changing and alternative perspectives, in contrast to the conventional poverty-environment nexus and vicious downward spiral of need, the sustainable livelihood approach has gained prominence. For one thing, this approach shifts the analysis from macro-economic and macro-environmental to a study of how micro-level institutions moderate the impacts of the macro environment to foster sustainability (see wb1n0018.worldbank.org/ESSD/NRMTG). The focus here is on people in places and how they use their asset and strategies in lieu of macro environment.

The Sustainable Livelihoods (SL) approach provides a useful framework to analyse mountain livelihoods and poverty issues to derive relevant policy inferences (Rasmussen and Parvez, 2002). The starting point of SL is the assets and strategies of the poor, not their deprivation or condition described in a passive or objective manner. The key focus is on developing an understanding of the creative emergence of the poor, and how people and communities strategise to make use of their existing human, social, natural, physical and financial capital to overcome vulnerability and achieve sustainable livelihood outcomes, for example, improved food security and sustainable use of natural resources. As Banuri and Khan (2001) point out that this provides an interesting entry point to 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" (p. 177).

Rasmussen and Parvez (2002) see four distinct advantages in adopting the SL approach for understanding mountain development issues. They are:

- m SL helps focus attention on people and their livelihoods instead of resources and their depletion
- m SL analysis predominantly focuses on opportunities over constraints. NA mountain communities main asset has been the high levels of social capital

based on cohesive communities with well-established traditions of cooperation and collective work.

- m SL framework, by defining poverty as a fundamental lack of basic assets has potential to directly incorporate considerations of mountain specificity such as isolation and fragility that contribute to vulnerability of livelihoods in mountain environments
- m SL makes possible integrated and explicit analyses of various conditioning factors, both exogenous and endogenous, which catalyse or impinge on mountain livelihood development (p. 8).

AKRSP, for example, can be seen as an effort to help the poor overcome their vulnerability by developing their individual and collective capacities. AKRSP does this by providing the poor access to credit, encourage savings, invest in their skills and human resources, support the construction of infrastructure, and most importantly, invest in collective institutions. Programmes such as AKRSP, using the sustainable livelihoods approach, should be adopted in all of the NA.

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