

GUIDELINES FOR MAINSTREAMING THE ENVIRONMENT FOR PRO-POOR GROWTH & DEVELOPMENT
IN POLICIES, STRATEGIES AND PLANS OF THE ROYAL GOVERNMENT OF BHUTAN

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FOREWORD

ACKNOWLEDGMENTS

EXECUTIVE SUMMARY

INTRODUCTION – THE POVERTY-ENVIRONMENT MAINSTREAMING GUIDELINES

1.1 - Purposes & audience of the Guidelines

The guidelines are intended to provide practical and technical advice and guidance on how to mainstream poverty-environment issues into plans. Through selected examples, they demonstrate that it is possible to meet both the social and economic needs of the people - and alleviate poverty - and at the same time to conserve the natural environment.

The guidelines are written primarily for officials in planning and finance departments who are involved, at the national and dzongkhags levels, with the preparation of plans. They will also be of interest to other sector officials in national and local governments, Civil Society Organisations and to the private sector.

Ideally the poverty-environment mainstreaming guidelines, in conjunction with the other thematic guidelines, should be annexed to the guidelines issued for the preparation of the Five-Year Plans. The specific role of the poverty-environment mainstreaming guidelines is to promote the development of an holistic view when issues related to poverty, environment and economic development have to be addressed, and for planners to realize that there might be alternatives to what each sector usually considers as the universe of possibilities, maximizing the overall results.

1.2 - How the Guidelines relates to other guidelines & manuals

The guidelines mainly put into perspective poverty and environment issues in the context of economic development. It is not a policy document, nor a technical document explaining how environment and poverty matters have to be dealt with. There are other documents for that, for example the Local Development Planning Manual, the Rural Economy Advancement Programme Strategic Framework and its operational documents (Village participatory planning guidelines, Village Development Plan framework) dealing with the operationalisation of the targeted poverty interventions programme under the 10FYP, and the various regulations, codes of practice, sectoral environmental assessment guidelines dealing with environmental issues.

1.3 - How to use the guidelines

Part A of the Guidelines sets the overall context, in terms of challenges of development and the strategies of the Royal Government. What is meant by poverty and environment in this document is briefly discussed. The particular linkages existing between the environment and the Bhutanese economy are then summarized. The various linkages existing between poverty and environment are then presented following the categories usually used in the poverty-environment literature: livelihoods and the environment, health and the environment, vulnerability and the environment, and economic growth and the environment.

Part B of the Guidelines starts by defining what is meant by poverty-environment mainstreaming, looks at its importance and present various tools and techniques for mainstreaming.

Part C looks into poverty-environment linkages in planning, budgeting and monitoring, coming in particular with recommendations regarding poverty-environment indicators.

Part D portrays ways to mainstream poverty-environment issues for the following sectors: natural resources; trade, industry, tourism & mines; energy; education; health; infrastructure, urban development and transport.

PART A: CHALLENGES OF DEVELOPMENT, POVERTY-ENVIRONMENT DEFINITIONS & LINKAGES

1 - National Context, Challenges of Development & Strategies of the Royal Government.

1.1 - National Context

Bhutan is undeniably a country dominated by its rural dimensions and will continue to be so in the decades to come: not less than 69%¹ of its population live in rural areas, practising subsistence farming and relying on a range of natural resources to sustain their livelihoods. The share of the agriculture sector in the GDP has declined from the over 50% levels in 1986 to 22% in 2006², with the increase of the secondary sector (manufacturing, electricity and construction) and the tertiary sector (services). Development interventions in the last five decades have been successful in bringing basic services and facilities to the people³ and the average rate of growth over the period of the ninth Plan has been at 9%, largely due to the development of the hydropower sector. However the latest Poverty Analysis Report⁴ reported that in 2007 close to 31% and 8% of rural Bhutanese continue to live, respectively, under the poverty line and extreme poverty line, with a consumption of Nu. 1,097 or less, and Nu. 689 per person per month.

1.2 - Challenges of Development

The challenges of development faced by Bhutan are presented in details in various documents, including in particular the Vision 2020 and the 10FYP. They are based on numerous factors. The ones that are relevant to the Poverty-Environment approach are:

- **Limited available agricultural land**, consequence of a difficult topography: virtually all land suitable for intensive forms of cultivation is already in use, which some being now even converted to non-agricultural uses, with the rural-urban migration

¹ Population and Housing Census of Bhutan 2005, [update](#).

² Poverty Analysis Report 2007.

³ Rapid Assessment of Rural Development, 2007.

⁴ Poverty Analysis Report 2007.

and industrialisation. Fragmentation of land holdings, landlessness, sharecropping arrangements. This puts a limit to the extent

- **Population growth:** Despite having the lowest population density in the region and the significant reduction of the rate of population growth in the last decade, the population growth is still one of the biggest challenges faced by the country, having impacts in turn on the environment, food security, nutrition, employment, balance of payments; and ability to continue to provide services to a growing population.
- **Population migration:** Rural-urban migration, putting pressure on land, infrastructure, urban services, natural resources (directly or indirectly through pollution, degradation of forest cover, ...), limited job market.
- **Population distribution:** The population is largely scattered, with lives in remote and isolated areas still characterized by vulnerability and uncertainty. Ensuring that disadvantages and vulnerable groups are able to benefit more fully from the process of social and economic development is a challenge that must be met.
- **Infrastructure incomplete and costly to establish and maintain.**
- **A nascent private sector.** The contribution of the private sector to the economic development of the country and as a source of employment is still minimal. The private sector is still at an early stage of development and is not yet well organized.

The MDG Needs Assessment and Costing exercise⁵ identifies the following challenges at the level of the various sectors (Table x). Most of the proposed interventions have direct linkages between, on the one hand, pro-poor growth and poverty reduction, and, on the other hand, good environmental management. These are presented in more details in section x.x of the document.

Agriculture and rural development

- Slow growth of the agricultural sector and declining investments
- Low agricultural productivity and crop depredation by wildlife
- Underemployment and lack of off-farm employment in the rural sector
- Inaccessibility
- Environmental degradation risks
- Rural-urban migration
- Urban poverty and youth unemployment

Education

- Low levels of adult literacy, particularly among women and in rural areas
- Quality and relevance of education
- Difficulties of continuing to expand enrolment levels notably in hard to reach communities and isolated areas
- Strengthening the secondary and post-secondary levels both in terms of teacher strength and educational infrastructure
- Improve educational access for those with physical disabilities and learning impediments.

Gender

- Greater effort towards attaining gender parity at the tertiary education levels.
- Promoting greater female enrolment into technical, professional and vocational institutions.
- Increase female participation in national parliament, public office and civil service.
- Domestic violence against women.

Health

- Child health (including control of diarrhoeal diseases, acute respiratory infection, ...)
- Maternal health
- Communicable diseases: HIV/AIDS, Malaria and TB

Environment

- Lack of coordination in environmental mainstreaming
- Need for a comprehensive environmental legal and policy framework
- Weak compliance and enforcement of environmental regulations
- Inadequate capacities of relevant environment agencies such as the National Environment Commission, Environment Units within Ministries, Dzongkhag Environment Committees, Dzongkhag Environment Officers, Disaster Management Division within MoHCA, and line ministries
- Lack of proper scientific environmental data and information, and environmental monitoring systems

Water and Sanitation

- Acute shortage of specialized manpower
- Data problems and unplanned growth
- Poor linkages and lack of capacity in Dzongkhags and municipalities
- Technical and financial sustainability
- Lack of training opportunities
- Coordination with stakeholders (for rural areas)
- Ensuring quality levels for water and sanitation in rural areas
- Distance from water source

Socio-economic progress achieved during the last FYP, the implementation of the 10FYP, the acceleration of the economic development - through various means -, and the increase of the population are likely to increase pressure on the natural resources of the country, by creating demand for new land for settlement, expansion and modernisation of agriculture, infrastructure development, hydropower development, urbanisation, tourism, industrial development and overall change of consumption patterns. As stated in the 10FYP, it is also likely that environmental conservation imperatives, that have been the perceived trade mark of

⁵ Bhutan Millenium Development Goals. Needs Assessment and Costing Report (2006-2015).

Bhutan, will be more and more challenged by the desire to accelerate economic development and the urgency to respond to poverty. The linkages between a sustainable pro-poor economic growth and good environmental stewardship are the focus of this document.

1.3 - Strategies of the RGoB

The 10FYP is to be realized through a number of strategies, such as:

- Vitalizing economic and industrial development (encompassing hydropower, tourism and cultural industries, ICT);
- Implementing national spatial planning, with the intent to promote a balanced regional development consistent with the maximization of the economic potential and opportunities while conserving environmental resources;
- Synergizing rural-urban linkages for socio-economic development and poverty reduction, in particular using urban and external market demand and consumption as important drivers for rural growth, income generation and enhanced productivity;
- Expanding strategic infrastructure;
- Investing in human capital and fostering an enabling environment through good governance.

The overall strategy of the 10FYP for poverty reduction is to promote economic opportunities through broad-based growth and to boost critical sectors such as agriculture and rural industries/enterprises that are important for the poor. This strategy is being translated into a targeted poverty reduction programme - the Rural Economy Advancement Programme - aiming at providing benefits directly to the poor on the basis of a good understanding of localized poverty and development conditions in the various Gewogs⁶

The approach taken in the 10FYP with regard to the environment is to consider that the sustainable use and management of natural resources constitutes an integral and critical aspect of national spatial planning. This approach is considered to integrate the environmental issues within the overall national development framework for the full realization of sustainable development.

2 - Poverty, Environment - Definitions

2.1 - Poverty

2.1.1 - Poverty - a few definitions

There are several approaches and definitions of what is poverty. In the report⁷ titled "*Linking Poverty Reduction & Environmental Management*" prepared by DFID, EC, UNDP and the World Bank poverty is viewed as encompassing income and non-income dimensions of deprivation, including:

- Lack of income and other material means;
- Lack of access to basic social services (education, health, safe water, ...);
- Lack of personal security;
- Lack of empowerment to participate in the political process and in decisions that influence someone's life.

Similarly, the UNEP & IISD publication, *Exploring the Links. Human Well-Being, Poverty & Ecosystem Services*, on the basis of an extensive and global survey of the literature on the various linkages between poverty and ecosystems defines poverty linked to ecosystems as the deprivation of the 10 following constituents/determinants of well-being, as follows:

1. Ability to be adequately nourished;
2. Ability to be free from avoidable disease;
3. Ability to live in an environmentally clean & safe shelter;
4. Ability to have adequate & clean drinking water;
5. Ability to have clean air;
6. Ability to have energy to keep warm & to cook;
7. Ability to use traditional medicine;
8. Ability to continue to use natural elements found in ecosystems for traditional cultural & spiritual practices;
9. Ability to cope with extreme natural events (floods, tropical storms, landslides);
10. Ability to make sustainable management decisions that respect natural resources & enable the achievement of a sustainable income stream.

As further developed in this report, there is a large degree of synergies among the 10 constituents of well-being. For example, access to clean water and clean air will permit the avoidance of a number of diseases and pathologies, and similarly living in a clean & safe shelter will require access to clean air, adequate & clean drinking water.

Human well-being is considered as the extent to which individuals have the ability and the opportunity to live the kinds of lives they have reasons to value. Human well-being encompasses personal and environmental security, access to materials for a good life, good health and good social relations, all of which are closely related to each other, and underlie the freedom to make choices and take actions.

⁶ See REAP Strategic Framework.

⁷ Linking Poverty Reduction & Environmental Management. Policy Challenges & Opportunities. DFID, EC, UNDP, WB. July 2002.

Poverty is usually measured in three ways:

- (1) a single indicator, such as income or consumption;
- (2) a multidimensional-indexed approach where several indicators are combined in a single index of poverty; and
- (3) a vector multi-dimension where several indicators are used to classify people as poor on each indicator.

The latter method has the benefit of taking into consideration the multiple dimensions of poverty, which is usually seen as broad, multidimensional, partly subjective, variable over time, comprising capabilities as well as welfare, and in part relative to local norms, comparisons and expectations⁸.

The Poverty Analysis Report 2007 prepared by Bhutan NSB states that "*Poverty [...] is a multi-dimensional phenomenon. This deprivation includes not just insufficient consumption (and income) but also lack of opportunities and assets, inadequate education, poor health and nutrition, lack of sanitation, insecurity and powerlessness.*"

2.1.2 - Poverty in Bhutan

The National Statistics Bureau considers, at this point in time, that poverty is best measured by the per-capita consumption expenditure, assumed to give a good representation of the well-being of households. A minimum acceptable standard of that welfare indicator is used to separate the poor from the non-poor, and was calculated at Nu.688.96 per person per month as the food or extreme poverty line and Nu.1.096.94 per person per month as the total poverty line, defining, respectively, the thresholds for the subsistence poor and the poor⁹.

The PAR 2007 estimates the proportion of poor people in Bhutan at 23.2 % (146,100 persons) and of subsistence poor people at 5.9% (37,200 persons). With 98.1% and 99.3% of the poor and of the subsistence/extreme poor, respectively, who reside in rural areas, poverty in Bhutan is mainly a rural phenomenon. Therefore poverty reduction efforts have to be largely focused toward rural poverty, which is the focus of these guidelines. A particular attention needs, however, to be given to urban poverty, especially in the context of a rapid growth of urban centers fueled by rural-urban migrations.

The existing state of poverty is usually attributed to the country's rugged and harsh terrain, limited infrastructure - providing inadequate access to markets, economic opportunities, resources, assets and social services - and limited availability of land for economic activities, shortage of labour and markets due to a small and scattered population, largely subsistence-based way of life in the rural areas, low levels of agricultural productivity and a private sector still under development¹⁰. Many farmers are considered to be trapped in subsistence farming with little surpluses, a situation exacerbated by their inherent vulnerability to weather fluctuations, chronic crop depredation by wildlife and the rapid emergence of a cash economy.¹¹

2.1.3 - Poverty reduction strategies

As it is stated in the *Challenge of Ending Rural Poverty* report, prepared by IFAD in 2001, having human beings condemned to short lives plagued by malnutrition, ill health and illiteracy is unacceptable neither from a moral point nor from an economic standpoint, as it leads to wasting talents and energies of men and women, diverted from socially productive activities that could create wealth for the entire society instead of merely struggling for their survival. In addition poverty poses a threat to social stability, social order and acts as a reservoir for communicable diseases and triggers for crime and conflicts¹².

The analysis of the situation is not different in Bhutan, which joins the pledge by many nations to attain the Millenium Development Goals and is well on track to achieve the MGDs by 2015¹³.

Poverty reduction is indeed the main objective and theme of the Tenth Plan, and the various strategies to realize this constitute the overall Tenth Plan's strategic framework for achieving Gross National Happiness, while the Rural Economy Advancement Programme operationalises the concept of targeted poverty reduction interventions (see section 1.3 above).

The RoGB aims to reduce the poverty proportion to 20% by the end of the 10th FYP through rural development, balanced regional development, integrated rural-urban development, private-sector growth and infrastructure development (BLSS, 2007).

Four key factors need to be addressed in any poverty reduction strategy:

- **Enhanced livelihood security:** the ability of the poor to use fully the potential of their assets¹⁴, to have legally secure entitlements to these assets (especially land and water) and capabilities to make living conditions of greater security and sustainability;
- **Reduced health risks:** the mitigation of factors that put the poor and most vulnerable (especially women and children) at risk from different diseases, disabilities, poor nutrition, and ultimately death;

⁸ The Challenge of Ending Rural Poverty, IFAD, 2001.

⁹ PAR 2007.

¹⁰ 10 FYP.

¹¹ Ibidem.

¹² The challenge of ending rural poverty. IFAD, 2001.

¹³ MDG 2008 report.

¹⁴ In particular through technology to increase the output and yield of food staples.

- **Reduced vulnerability:** the reduction of threats from environmental, economic, and political hazards, including the impact of both sudden shocks and long-term adverse trends;
- **Pro-poor economic growth:** enhanced economic growth is essential for poverty reduction, and the quality of growth, and in particular the extent to which it creates new opportunities for the poor, also matters.

2.2 - Environment

2.2.1 - Environment - definition.

Environment refers to the living (biodiversity) and non-living components of the natural world, and to the interactions between them, that together support life on earth. The environment provides goods (natural resources) and services (ecosystem functions) used for food production, the harvesting of wild products, energy, and raw materials. The environment is also a recipient and partial recycler of waste products from the economy and an important source of recreation, beauty, cultural, spiritual values, and other amenities¹⁵.

In the literature on poverty and environment, the term “*ecosystem*” is sometimes used to refer to this natural environment. These terms are exchangeable in these guidelines.

Box x.x - Biodiversity and ecosystem services

Ecosystems – such as forests, agroecosystems, grasslands, and freshwater ecosystems and the biodiversity contained within them – **provide essential services that contribute in numerous ways to productive activities**. Ecosystem services include **provisioning services**, such as food and water; **regulating services**, such as flood and disease control; **cultural services**, such as spiritual, recreational and cultural benefits; and **supporting services**, such as nutrient cycling that maintain the conditions for life on Earth.

Some example of ecosystem services that support livelihoods include provision of natural habitat for wild pollinators that are essential to food crops; natural predators that control pests and soil organisms important to agricultural productivity; watershed protection and hydrological stability, including recharging of water tables and buffering of extreme hydrological conditions; maintenance of soil fertility through storage and cycling of essential nutrients, and breakdown of waste and pollutants.

These services are “public good”, providing indirect values that are only partially traded in the market place but that are vital to the livelihoods of the poor, especially in more marginal environments or where the poor have limited access to external technology and other inputs (Koziell and Saunders, 2001). By maintaining productivity and a healthy and stable environment, ecosystem services also contribute to maintaining livelihood options and the potential for livelihood diversification. When ecosystem functions are impaired, this inevitably leads to a narrowing of livelihood choices and an increase in the vulnerability of the poor (BDP, 2001; Koziell, 2001; Koziell and Saunders, 2001). While biologically diverse ecosystems can be highly resilient to human disturbances, certain ecosystem types are at particularly risk of a sudden collapse. For example freshwater systems may go from a functioning to a nonfunctioning state in a very short time due to pollution, overuse, or other perturbations that reduce biodiversity or that exceed a certain threshold of tolerance. The consequence is that people who depend on these ecosystems may find themselves deprived of essential goods and services in a relatively short time span and unable to cope or adapt (Folke, 2002).

2.2.2 - The Environment in Bhutan, Status and Challenges

Bhutan has entered the 21st century with relatively little damage done to its environment, a result of a long isolation, a low human population, inaccessibility of much of the country, and conservation ethics underpinned by the traditional values and way of life that revere nature. The conservation of the environment is one of the four foundation pillars of Gross National Happiness, with sustainable and equitable socio-economic development, preservation and promotion of culture, and good governance.

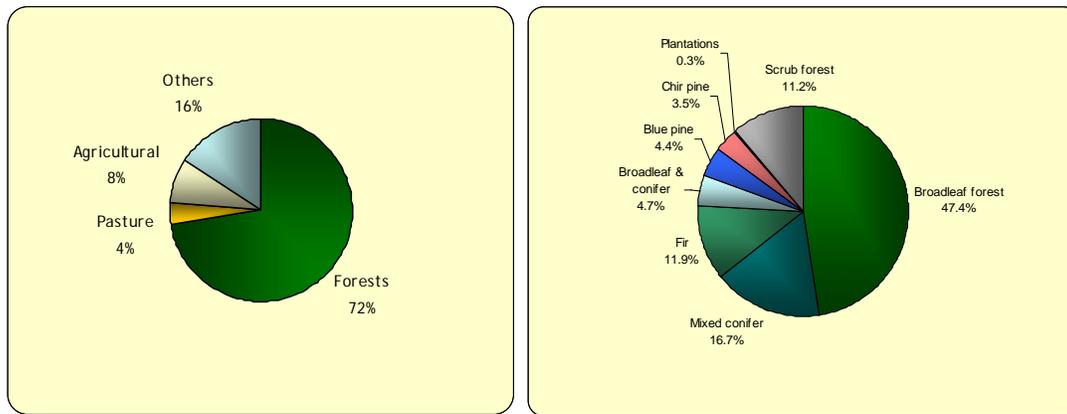
The country is a conservation showpiece of the Eastern Himalayas, a region recognized as one of the global biodiversity hotspots. The country’s large tracts of sub-tropical and temperate forests, the alpine scrub, meadows in the northern mountains, and the many rivers, lakes and marshlands harbor several species of wild fauna and flora which are known to be globally threatened.¹⁶

Land use. In 1995, forests¹⁷ occupied 72% of the total land, while 8% of the land is agricultural land, 4% is made of pasture lands and the remaining 16% is made of other land uses (snow/glaciers, rock outcrops, water bodies, settlement). The forest lands were distributed as shown on the figure below, and the national policy is to maintain at least 60% of forest cover for all times to come and is a constitutional requirement.

¹⁵ Linking Poverty Reduction & Environmental Management. Policy Challenges & Opportunities. DFID, EC, UNDP, WB. July 2002.

¹⁶ Bhutan Environment Outlook 2008. NEC.

¹⁷ Including scrub forest.



Overgrazing, forest harvesting, forest fire, conversion of agricultural and forest lands for infrastructure development and urbanization, and unsustainable agricultural production practices have led to land degradation in a number of places, especially in eastern and southern Bhutan. Land degradation problems are compounded by the country's inherent fragile geology and extreme climatic conditions characterized by heavy monsoon rains. In and around population centers land resources are also being impacted by improper disposal of solid waste.

The country is endowed with abundant water resources resulting from the many glaciers and glacial lakes, the large forest cover and the high precipitation. There are, however, localized water shortages resulting from an increased demand, the rugged terrain making water tapping difficult and poor maintenance of tanks and distribution lines. Although the sediment load of rivers is usually low¹⁸, improper infrastructure development and erosion in watershed can lead to localized increase of sediment load. Water pollution is an issue in urban centers where surface drainage, uncontrolled seepage or overflow of septic tanks and pipes, enter the water courses.

Emissions from vehicles, industries and domestic activities are the main sources of localized pollution of the air, which is otherwise of a good quality¹⁹. Although a significant proportion of the population uses electricity, liquefied petroleum gas, fuelwood, is still used by 37%²⁰ of the households for cooking, a source of respiratory disease in some places.

As indicated above Bhutan is certainly a conservation jewel of the Eastern Himalayas and one of the biodiversity hot spots in the region. The various habitats are believed to contain more than 5,600 species of vascular plants, 600 species of birds and 190 species of mammals²¹, of which 26 species of mammals and 14 species of birds are listed in the IUCN's red list of threatened species. Some 20 crop species and 10 livestock species are known in the country, with 350 varieties of rice, 47 of maize, 24 of wheat and 30 of barley, and 4 native breeds and 16 native sub-breeds of cattle, and 12 native sub-breed of yaks²².

The national protected area system covers altogether an area of xxx km², or xx% of the country's total area. These various protected areas are linked by a network of biological corridors to facilitate the movement of wildlife and provide a contiguity of habitats between the various protected areas.

2.2.4. - Environment Management Strategy

Aware of the problems that uncontrolled economic progress can cause, while opening it to the rest of the World, the Royal Government of Bhutan has chosen the "middle path" of sustainable development, in order to raise the living standards of the present population without compromising the country's cultural integrity, historical heritage or the quality of life for future generations²³. The overall objective of the National Environment Strategy is to minimize and mitigate the impacts resulting from the development process. Environmental conservation, in the context of Bhutan, is understood in its dynamic form, with natural resources considered as an asset to be sustainably and wisely utilized for socio-economic development, for the current and for the future generations. It is one of the four foundation pillars of Gross National Happiness, with sustainable and equitable socio-economic development being another one.

The National Environment Strategy outlined in 1998 three main avenues of sustainable economic development: expanding hydropower, increasing agricultural self-sufficiency and expanding the industrial base, each of them being major themes in the 10FYP. The strategy is looking at the impacts of these avenues in an holistic way, integrating the various environmental, social, cultural and economic aspects of these developments.

It is expected that the development of the hydropower sector will improve the living standards for Bhutan's own population, reduce high levels of domestic fuelwood consumption, and raise revenues. It is however recognised that the expansion of this sector will

¹⁸ Bhutan State of the Environment 2008.

¹⁹ BSO, 2008.

²⁰ Population and Housing Census of Bhutan, 2005.

²¹ BSO, 2008.

²² BSO, 2008.

²³ The Middle Path. National Environment Strategy for Bhutan. NEC, 1998.

depend on maintaining the integrity of the watersheds, minimizing illegal cutting, unsustainable rangeland practices, agricultural expansion and road development.

Increasing food sufficiency does face constraints, such as a limited amount of arable land, hindering extensification, unless it is done at the cost of land conversion; the rough nature of the terrain, making intensification through mechanization difficult; the population increase, although its growth has reduced recently; loss of arable land to urbanization. Similarly, land conversion can threaten watershed maintenance and intensification of agriculture could impact on soil fertility.

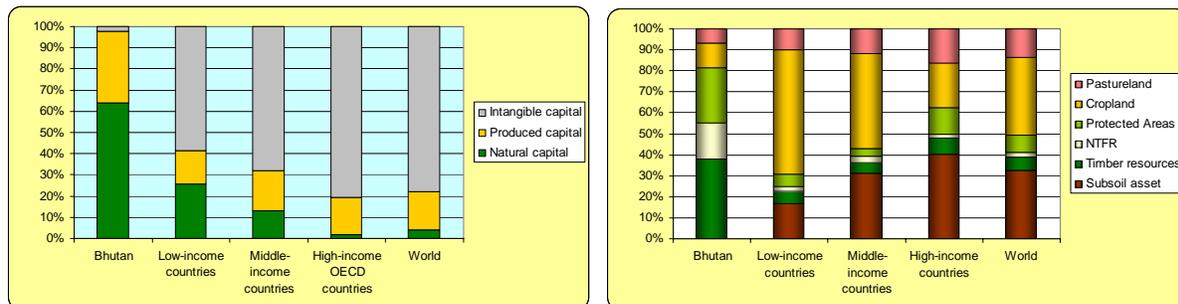
The industrial development of Bhutan is based on four main resources: hydropower, wood, agriculture and minerals. The National Environmental Strategy insists on the constraints to the industrial development, including competition for land use, the difficult topography making transport, communication, and access to and supply of raw materials costly, and unsustainable migration of rural populations to industrial complexes. The Strategy emphasizes the need to incorporate environmental criteria into industrial development planning processes, including setting environmental quality standards, establishing a legal basis to enforce environmental regulations and using environmental impact assessment to screen out potentially damaging projects.

The National Environment Strategy also looks, in an integrated way, into the development of tourism and its effect on culture and the environment, the impacts of roads on the environment, resource-based mechanisms for financing sustainability, interactions between the environment and public health, the impacts of the rapid urbanization.

3 - Environment - Economy Linkages

3.1 - Natural capital: the main contributor to Bhutan's wealth

In a study undertaken by the World Bank in 2006 identifying where is the wealth of Nations²⁴, Bhutan stands out the rest of the World by the importance of its natural capital. The figure on the left shows the shares of the total wealth between natural capital (mainly natural resources), produced capital (buildings, machinery, equipment and infrastructure) and intangible capital (raw labor, human capital, social capital, quality of institutions, ...), and the figure on the right shows the shares of natural wealth.



With 64% of the wealth of Bhutan coming from its natural capital, which is far above the share of the natural capital for any other group of countries, it is clear that a very diligent attention has to be given to this sector, while a lot of efforts have to be made in raising the intangible capital of the country, made of human capital and the quality of formal and informal institutions.

Natural resources are special economic goods because they are not produced, and therefore will only yield long term economic profits - rents - if they are properly managed. These rents can be in turn an important source of development finance, and some countries have successfully used natural resources in this way, saving this wealth and transforming and investing it into produced and human capitals. Achieving this transition from natural-resource dependence to a sustained and balanced growth requires institutions that are capable of managing the natural resource, collecting resource rents, and directing these rents into profitable investments.

Even if in Bhutan environmental conservation is one of the 4 pillars of Gross National Happiness, it is also obvious that the increased pace of economic growth is putting and is going to put the environment and the natural resources under increased pressure²⁵. The objective of this section is to provide economic evidences for persuading economic and development decision-makers to fully acknowledge the contribution of the environment to growth - and pro-poor growth in particular -, to buy into policies which encourage its sustainable use and management, and to ensure that adequate resources are invested in environmental goals. In other words, it aims at convincing decision makers that environmental sustainability is not a luxury that a government cannot afford but a necessity that they cannot afford not to invest in.

Before presenting, in general terms, evidence of the actual links between the environment and pro-poor economic growth, we will briefly present here the linkages between the environment and the economy. Numerous studies have been prepared on this topic and this section is built, in particular on the World Bank publication *Where is the Wealth of Nations?* and the UNDP-UNEP PEI publication *Making the Economic Case*.

3.2 - The significance of the environment for economic development

The section below presents overall evidence about the economic, development and poverty reduction benefits of the environment to public sector decision-makers, so as to justify and promote environmental investment.²⁶

²⁴ World Bank, *Where is the Wealth of Nations?*

²⁵ 10 FYP.

²⁶ This section will have to be strengthened with the results of the PER.

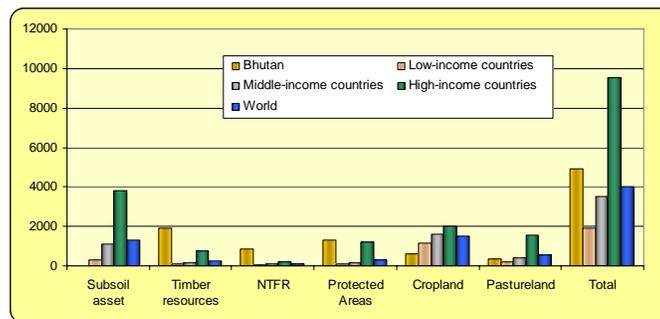
Environmental investment is taken to mean the effort, attention and material support accorded to environmental sustainability in public budgets, policies and planning. This includes ensuring (1) that sufficient government funds are allocated to the agencies responsible for environmental management and conservation; (2) that environmental goals are prioritized and incorporated into macroeconomic and sectoral policies and the instruments that are used to achieve them; and (3) that economic and development projects and programmes factor environmental costs and benefits into their calculations, and do not impact negatively on the environment.

The environment has to be considered on an equal footing with other stocks of productive capital and sources of wealth (assets) in economic, statistical, policy and budgetary terms²⁷, generating important benefits for economies, such as economically important goods (timber, minerals, NTFP, water - and in particular water for hydropower generation and sale - , agricultural products, ...) and services (maintenance of water flow and quality, climate regulation, support to agricultural productivity, protection against disasters, ...). These goods and services are a **source of livelihoods**, and therefore of **revenues** and **employment** for the many people directly dependent on natural resources, which in the case of Bhutan makes up to 69%²⁸ of the population. These environmental goods and services make a significant contribution to the indicators used to measure progress towards economic growth, development and poverty reduction. Decision makers have to fully realize that there are trade-offs between investing in sustaining this natural capital and converting it to other uses.

In the case of Bhutan, the “natural capital” represented in 2000 not less than 64% of the wealth of the country. A good management of ecosystems and natural resources is and will be therefore key to sustaining development for all the Bhutanese people while infrastructure, human and institutional capitals are progressively being built. It is therefore essential for the country to put a strong focus on maintaining the quality of this natural capital and to keep its specificities, such as a large share of timber resources, non-timber forest resources and protected areas (totaling more than 80% of the natural wealth), while improving the quality of the agricultural and pasture assets, constrained by the topography of the country.

The large share of natural resources in total wealth and the composition of these resources make a very strong argument for the role of environmental resources in reducing poverty and, to a certain extent, in guaranteeing food security. It also stresses on the importance for the Finance Ministry in developing a comprehensive agenda that looks at natural resources as an integral part of their policy domain.

The World Bank research²⁹ finds that the value of natural capital per person actually tends to rise with income when we look across countries, which contradicts the perception that development necessarily entails the depletion of the environment. It is also interesting to note, from figure xx that Bhutan has the second highest level of natural capital per capita after the high-income countries and above the middle-income and low-incomes countries.



If growth is essential to meet the MDG by 2015 and to contribute to the reduction of poverty, it will be illusory, and short-sighted, if such a growth is based on depleting the natural capital, as land and other natural resources are in fact key in sustaining income generation.

3.3 - How environmental investments translate into pro-poor growth?³⁰

This section provides concrete evidences about the contribution of environmental investment to pro-poor economic growth, and is looking in particular at the contribution of the environment sector (environmental goods and services) to economic growth, employment, generating public revenues, generating foreign exchange earnings, reducing expenditures, trade balance, reducing poverty, and meeting the MDGs.

3.3.1 - Achieving national economic growth

- Agriculture, livestock, forestry accounted for 18.6 percent³¹ (Nu.9.6 billions) of the GDP in 2007;

²⁷ See above on environmental expenditures.

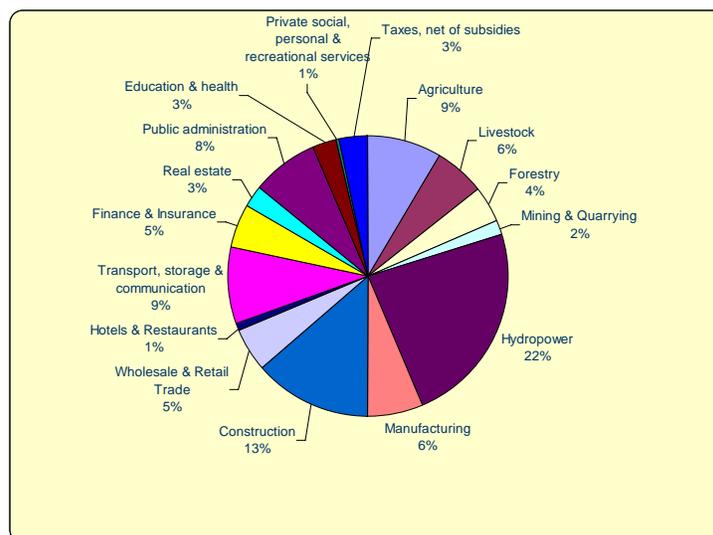
²⁸ Give reference.

²⁹ Give full reference. WB. Where is the wealth of Nations?

³⁰ Detailed information is not available yet, but could be gathered during the second phase of PEI.

³¹ Statistical Year Book of Bhutan 2008.

- Hydropower contributed 23.4 percent³² (Nu. 12 billions) of the GDP in 2007;
- Tourism, based on culture and environment, accounts for xx percent of GDP (absolute figure);
- All together, agriculture, livestock, forestry, quarrying and hydropower represented nearly 44 percent³³ (Nu. 22.5 billions) of the GDP in 2007;



In addition to the importance of the recorded environmental output and income to the national economy and to keys sectors, it is important to keep in mind their multiplier effects across the economy.

Subsistence-level benefits are one category of economic values which are often excluded from estimates of sectoral output and income, even though they tend to be particularly important in terms of pro-poor growth. Taking the example of the forest sector, non-timber forest products often generate considerable economic output at the local level, although they are rarely incorporated into formal estimates of output. Fuel wood that comprises the primary source of household energy is a good example.

Another category of economic benefits which remains hidden in national and sectoral statistics is the contribution made by the environmental services provided by specific ecosystems (for example, waterflow and quality, biological productivity, soil condition and land productivity, landscape qualities). These services are often critical to sectoral output and income. For example the present value of sustainable upland forest management to hydroelectric scheme, as reflected in regular supply of water, in increased power revenues, lower dredging costs and an extension to the dam's lifespan, all factors of considerable importance for run-of-river projects as are most hydropower projects in Bhutan, can represent several tenths of millions of US\$, making the point that upper watershed management is in the direct economic interests of the power sector. Spending on nature tourism is also reflected in income, employment and earnings in the hotel, transport and handicraft industries.

3.3.2 - Providing employment

The environmental sector makes also a substantial and very visible contribution to the Bhutanese economy through the employment that it generates.

- The agriculture sector alone provided not less than 66.6%³⁴ (183,000 jobs) of all employment in 2007; with 83.5% (178,800) in the rural areas and 6.9% (4,200) in urban areas;
- Considering that a significant proportion of the industries are agro-based, forestry-based, mineral-based, water-based, the "natural resources" sector altogether provided, directly and indirectly, more than 75% of the employment in 2007 or around 205,000 jobs.
- In addition to the cash income provided, the tourism sector generates employment for many rural communities through trekking and nature tourism. It has a strong potential to be significantly enhanced.

An improved incorporation of environmental concerns into large infrastructure projects, and especially hydropower projects, will also undeniably generates further challenging employments, in the design, implementation, and monitoring of measures to be taken to minimize and mitigate the impacts of such projects.

3.3.3 - Generating revenues

³² Statistical Year Book of Bhutan 2008.

³³ Statistical Year Book of Bhutan 2008.

³⁴ Ibidem.

Public revenues. Maintaining healthy public budgets and sustainable revenues generation are a major concern for economic and development decision-makers. The table below shows the key earning sectors of the RGoB, and the place of the environment sector. As a key earning sector, sustainable environmental management is essential in terms of good public financial management.

Prepare a table/figure showing the source of revenues and the annual receipt

Improved revenue generation, and the capture of environmental benefits, can be achieved by rationalizing and improving existing environmental charges, fees and taxes and by introducing new payment systems for environmental goods and services³⁵. Environmental fiscal reforms, payments for environmental services and carbon finance (in particular in relation to the development of the hydropower sector) could also be seen as mechanisms for assisting the government to raise revenues, while simultaneously furthering poverty reduction and environmental goals.

<p>Direct sources of revenues</p> <p>Many sources of government income are raised from the activities which depend on environmental goods and services, and can be presented as evidence of the contribution of the environment to public revenues, including:</p> <ul style="list-style-type: none"> • taxes (e.g. on income and profits from environment-based industries and enterprises, taxes on inputs used in environment-based industries and enterprises, retail, sales and value-added taxes on environmental products, airport taxes on nature tourists, etc.); • other levies (e.g. bednight levies on hotels which serve nature tourism destinations, import and export levies for environmental inputs or products, etc.); earnings of state-owned enterprises (e.g. those based on forestry, mining, etc.); earnings of public utilities which depend on environmental services (e.g. water, energy, sanitation, etc.); royalties and earnings from the rental, lease or sale of state-owned products and land areas (e.g. wild product export revenues, sales of minerals, concession fees for nature tourism destinations, timber royalties, bioprospecting fees, forest concession fees); • fees and charges on resource use (e.g. prospecting licences; firewood collection charges, timber felling fees, non-timber forest product harvesting permits, protected area entry charges, fees for the use of protected area facilities, etc.); • payments for environmental services (e.g. watershed fees, catchment protection charges, levies on water use, sales of carbon credits, etc.). <p>Source: Making the Economic Case: A Primer on the Economic Arguments for Mainstreaming Poverty-Environment Linkages into National Development Planning. UNDP-UNEP Poverty Environment Initiative.</p>

Revenues and cash incomes

- In 2007, revenues generated by the tourism sector amounted to US\$29M.
- Environmental goods and services contribute up to xx percent of government revenues (*absolute figure*).

3.3.3 - Contribution to a favorable trade balance and generating foreign exchange earnings

Both absolute figures and percentage contribution of this sector to the overall total

Export of hydropower represented in 2007 the top commodity export, valued at Nu.10 billions, and nearly 44.5% of all exports; while vegetable fats and oils cement, represented respectively 5.4% and 2.2% of the exports, valued at Nu.1.2 billions and Nu.0.49 billions. Environmental goods and services contribute xx percent of foreign exchange earnings (*absolute figure*).

The Tourism sector contributes more than xx percent of foreign exchange earnings (*absolute figure*)

3.3.3 - Reducing expenditures

The continued provision of environmental goods and services saves costs for the government, the private sector, and at the household level.

Natural resources provide a cheap, reliable, sustainable and accessible source of income and basic needs (thus reducing the need to make cash expenditures on purchased alternatives), and also reduce the likelihood of broader economic losses and damages (for example health costs, loss of income, reduced production and public expenditures on mitigating the effects of disasters).

Sustainable environmental management and natural resource extraction ensure that long-term economic costs and losses are avoided. In most cases the costs of environmental degradation are immense when calculated at the national level, and the long-term losses of unsustainable land use and resource exploitation are huge.

Maintaining natural ecosystems for the provision of important goods and services is also often a more cost-effective option than providing these goods and services through artificial technologies. Conserving an upstream forest, for instance, typically costs far less than investing in water filtration and treatment plants downstream. Protection of water catchments to secure reliable water supplies costs also far less than having to provide water or having to relocate households.

A wide range of costs are associated with environmental degradation:

- Health damages arising from pollution and poor water supplies incur both private and public medical expenditures, as well as result in decreased production and income through work days lost;
- Reduction in cultivable area and decreased crop yields due to soil erosion compounded by poor land use management, leading to food insecurity and migrations;
- Deforestation leads to losses, including from sustainable logging, non-timber forest products, tourism and recreation, jeopardizing livelihoods;

³⁵ For example a user charge for forest watershed services providing resources for watershed conservation.

- Reduced resilience to natural and human-induced disasters, including climate change and variability, translating into huge human and financial costs, diverting resources from development activities.

Reducing expenditures through good environmental management

Key sources of environmental costs to the economy

- Depletion of economically valuable resources, species and products (for example through over-exploitation or the use of destructive harvesting techniques),
- Degradation of habitats and ecosystems which provide economically valuable environmental services: either directly (for example through pollution, unsustainable land and resource management or conversion to other uses) or indirectly (for example through interfering with the hydrological regime or water quality of rivers and streams feeding a particular site, reducing the biological diversity of a given area, or introducing alien invasive species which interfere with habitat composition and functioning),
- Other sources of air, land, water, noise and visual pollution which incur costs to humans and to the economy through compromising environmental quality.

Maintaining future streams of economic benefits

- One element of cost avoidance is the maintenance of the flows of income, employment, earnings and economic activity. Environmental degradation will be reflected in a decline or loss of some or all of these indicators

Avoiding other costs, losses and expenditures

Environmental degradation – or insufficient environmental investment– is manifested as costs and losses to the economy, including:

- Production losses –reduced employment, output and earnings that occur when production is affected by the loss of important environmental inputs or services. Examples include the decrease in the lifespan of a hydropower scheme (and thus its output and income) as a result of sedimentation and siltation, reductions in agricultural output as a result of the loss of irrigation water or soil fertility, reduced non-timber forest products harvesting occurring through the conversion of forest habitat or loss of biodiversity, reduced livestock yield resulting from land and water pollution, etc.
- Physical damage costs – loss of infrastructure, production and other assets as a result of poor environmental quality or environmental disasters. Examples include the value of roads, bridges, buildings and crops washed away as a result of flooding arising from the loss of upstream wetlands, the losses incurred to rural communities through landslides caused by upland deforestation, etc.
- The necessity of making expenditures to mitigate or avert the effects of environmental degradation—cash outlays that government, private sector or the general public must make to cope with the effects of environmental damage. Examples include the costs of resettling affected populations, medical expenditures to cope with the human health problems arising from environmental pollution, purchasing bottled water when other sources become polluted, establishing flood control measures, etc.
- Costs of replacing lost or degraded environmental goods and services— purchased technologies and products people must use as replacements or substitutes for environmental goods and services. Examples include purchasing foods to replace wild food sources for humans or livestock, utilising kerosene instead of firewood or thermal power plants instead of hydro schemes, putting in artificial water reservoirs and purification plants instead of relying wetland water storage treatment services, installing on-farm measures to check sedimentation and siltation rather than relying on forest catchment protection, etc.
- Knock-on impacts on other prices – prices of other goods and services that are affected by a decline in environmental quality. Examples include lower house prices in areas which have become affected by landslides or where landscape quality has declined, increased food prices arising from a decline in production caused by environmental degradation, rising costs of raw materials due to over-exploitation and reduced availability.

Source: Making the Economic Case: A Primer on the Economic Arguments for Mainstreaming Poverty-Environment Linkages into National Development Planning. UNDP-UNEP Poverty Environment Initiative.

3.3.4 - Alleviating and reducing poverty

Poverty reduction lies at the root of macroeconomic and sectoral development goals in Bhutan. Being able to provide evidence that environmental investment is a key strategy for alleviating and reducing poverty is therefore critical when making a case for mainstreaming the environment into national and sectoral development processes.

Because the poor tend to rely much more heavily on environmental goods and services than other sectors of the population, and as they are less able to deal with the effects of environmental degradation and loss, including the effects of natural disasters and changes induced by climate change, the maintenance of good environmental status is essential to meeting their basic needs and alleviating poverty over the short and medium-term. Natural resource degradation and over-exploitation is often carried out to the primary benefit of richer groups, leading to both on-site and off-site costs to the poor (for example their marginalization and alienation from productive lands and resources, reduced water supplies and soil erosion).

In terms of long-term poverty reduction, environmental resources provide a stock of wealth which can enhance economic resilience and offer opportunities for economic growth for the poor, as well as being converted into broader development benefits. If sustainably managed, natural capital or environmental assets provide a means of generating wealth and income which can both directly benefit the poor through strengthening and expanding their livelihood base as well as providing an important source of development finance, hydropower revenues for example, that governments can reinvest in poverty-focused growth.

For example, small and medium-scale enterprises owned and managed by primary producers and processors of natural resources can make substantial contributions to reducing the incidence of poverty and assisting households to escape the poverty trap. Likewise, investments which reduce or reverse environmental damage have potentially huge benefits in poverty reduction terms.

The RNR sector contributes in a significant manner towards enhancing rural household food security, consumption, income, employment and poverty reduction. Growth in agriculture and rural based activities, through a transformation of subsistence agriculture and development of a rural economy, has been demonstrated in many developing countries as the best and the most efficient way to address poverty. This sector has also a strong potential of growth.

Environmental Investment & Alleviation of Poverty

Accessing economic data on economic aspects of poverty-environment linkages

Detailed studies carried out on a specific topic or in a particular location (for example the role of forest products in the livelihoods of the poor, the relative contribution of different income and expenditure items for different socio-economic groups, the economic significance of environmental goods and services in times of emergency or stress, etc.), if they do provide economics data relating to poverty, tend to contain qualitative information more than quantitative data.

- For these reasons, accessing quantitative figures on the contribution of environmental investment to alleviating and reducing poverty often requires that primary data collection is carried out, and new studies commissioned (see section on PE indicators and the REAP).
- When attempting to extrapolate the findings of studies carried out in one place to another situation, it is necessary to be even more cautious than would usually be the case. Economics data relating to poverty are particularly hard to generalise, and are usually context-specific.

The reliance of the poor on environmental goods and services

Household socio-economic surveys or income and expenditure surveys which identify the main components of household production and consumption tend to be good sources of evidence about the reliance of the poor on environmental goods and services, and the ways that they are affected by environmental degradation and loss.

They are particularly useful when they also contain information which permits stratification according to relative wealth status, and an analysis as to determine relative reliance on environmental goods and services, and their role in livelihoods, for different socio-economic groups.

Environmental investment as a mechanism for poverty reduction

- Data to provide evidence on the opportunities for environmental investment to reduce poverty (either through generating income, employment and other benefits or through reversing environmental degradation) usually rely on case studies of particular development efforts (for example environmental enterprise development, natural resource value-added and processing activities, introduction of new resource-based income and employment generating endeavours, replanting of forest cover, wetland restoration etc.).
- Project, enterprise and investment feasibility studies and appraisals provide a particularly good source of data on the potential for converting environmental resources in to poverty reduction benefits. In most cases they contain both projections of potential income and benefits to be gained from undertaking the activity, as well as a detailed identification of stakeholder groups and beneficiaries.
- Evaluation studies of projects which have already been carried out can also yield important, and convincing, data about the actual poverty gains from generating income and other benefits from the environment, and the impact of activities on the status of the poor and the incidence of poverty.
- Project, enterprise and investment feasibility studies and appraisals provide a particularly good source of data on the potential for converting environmental resources in to poverty reduction benefits. In most cases they contain both projections of potential income and benefits to be gained from undertaking the activity, as well as a detailed identification of stakeholder groups and beneficiaries.
- Evaluation studies of projects which have already been carried out can also yield important, and convincing, data about the actual poverty gains from generating income and other benefits from the environment, and the impact of activities on the status of the poor and the incidence of poverty.

Source: Making the Economic Case: A Primer on the Economic Arguments for Mainstreaming Poverty-Environment Linkages into National Development Planning. UNDP-UNEP Poverty Environment Initiative.

3.3.5 - Meeting the MDGs

The environment makes an important contribution to meeting the MDGs. Environmental goods and services link not only to MDG 7, but also to the MDGs concerned with hunger, education, gender, child mortality, health, disease, water and sanitation. Conversely, environmental degradation poses a significant barrier to achieving MDG targets, and may ultimately undermine any progress that is made towards meeting them.

Table x: Key links between the environment and the MDGs (Source: Making the Economic Case, UNDP-UNEP Poverty-Environment Initiative).

MDG1 - Eradicate extreme poverty and hunger	Livelihood strategies and food security of the poor often depend directly on healthy ecosystems and the diversity of goods and ecological services they provide.
MDG 2 - Achieve universal primary education	Time spent collecting water and fuel-wood by children, especially girls, can reduce time at school.
MDG 3 - Promote gender equality and empower women	Poor women are especially exposed to indoor air pollution and the burden of collecting water and fuel-wood, and have unequal access to land and other natural resources.
MDG 4 - Reduce child mortality	Water-related diseases kill and weaken children, making them more susceptible to other diseases.
MDG 5 - Improve maternal health	Indoor air pollution and carrying heavy loads of water and fuel-wood adversely affect women's health and can make women less fit for childbirth and at greater risk of complications during pregnancy.

MDG 6 - Combat major diseases	Up to one-fifth of the total burden of diseases in developing may be associated with environmental risk factors—and preventive environmental health measures are as important and at times more cost-effective than health treatments
MDG 7 - Ensure environmental sustainability	Current trends in environmental degradation must be reversed in order to sustain the health and productivity of the world's ecosystem

The human health benefits of clean water and air, and their economic importance, are of particular significance when making the economic case for investing in the environment. Air and water pollution both have a major impact on human health in both rural and urban areas. As the causes of air and water pollution are largely environmental in nature (from agricultural contamination, poor sewerage and sanitation facilities, upstream deforestation, siltation and sedimentation), an important point to make concerns the economic importance of the environment in helping to minimize or avert such health risks and costs, and to provide essential air and water quality services.

The economic significance of natural resource-based medicines and healthcare is in most cases substantial, both in terms of market values and savings on purchases of bought drugs, but also in relation to the benefits of health improvements and diseases avoidance. A similar situation holds for the case of foods, and their role in avoiding hunger and upholding household nutrition and food security, as a source of nutrition and a means of survival.

3.4 - The challenges of environmental conservation in difficult economic times

In the face of pressing needs for quick economic growth and poverty reduction, and on the grounds of scarcity of public funds, the environment has long been, and tends to remain, a low priority in public investment and policy formulation. In many cases “environmental sustainability” goals are still seen as being distinct from, or even as conflicting with - “development” goals. This is even more the case in difficult economic times. Environmental conservation, in the context of Bhutan, is understood in its dynamic form, with natural resources considered as an asset to be sustainably and wisely utilized for socio-economic development, of the current and the future generations.

We have seen above how the renewable natural resources sector plays a vital role in the growth, balance and stability of the country's economy, if not in the very culture of the country. The 10FYP mentions, however, how traditional values that once were the basis of the sound environmental conservation practices are eroding with economical and materialistic values gradually overshadowing considerations for the natural environment. There are also voices expressing that the environmental conservation policies are very strong and have affected the pace of implementation of energy projects due to lengthy procedures such as EIA and securing road clearances. We will see in the section of this document presenting the issues per sector that this is a wrong perception, and that, if environmental issues are properly taken into consideration in the planning of the project from the very beginning of the development, environmental plans prepared and converted into obligations, proper monitoring undertaken, the possible slowing down of project development has more to do with poor planning and insufficient resources than to too much importance given to environmental consideration.

3 - Poverty, Environment and Gross National Happiness

4 - Poverty - Environment Linkages

4.1 - Overall presentation of poverty - environment linkages

Before the 1987 Brundtland Commission, development progress was associated with industrialization, and measured solely by economic activity and increases in wealth. Environmental protection was perceived by many as an obstacle to development. *Our Common Future*³⁶ recognized environment or development as a false dichotomy. Focus shifted to “environment and development” and then to “environment for development”.

There has been numerous examples of:

- How environmental degradation is undermining development and threatens all aspects of human well-being and future development progress;
- How poverty is exacerbated by environmental degradation and unsustainable management of natural resources;
- How improving management of the environment benefits the poor and their well-being and improves the overall economic growth and well-being.

More than ever before, it is widely acknowledged that long-term development can only be achieved through sustainable management of various assets: financial, material, human, social and natural. Natural assets, including water, soils, plants and animals, underpin people's livelihoods.

When His Majesty the King Jigme Singye Wangchuck declared, not long after His coronation in 1974, that Bhutan's growth and progress will be guided by its Gross National Happiness instead of its gross domestic product He was more than ten years in advance of the international development forum, strongly believing that material wealth alone does not bring happiness, satisfaction and

³⁶ Give full reference.

well-being; and that the economic growth and modernization should not be at the expense of the quality of life and traditional values of the Bhutanese people, including the conservation of the environment.

Poverty-environment linkages are dynamic and context specific - reflecting both geographic location and scale and the economic, social, and cultural characteristics of individuals, households, and social groups. Different social groups usually give priority to different environmental issues. Globally, in rural areas, poor people are particularly concerned with secure access to and the quality of natural resources - arable land and water, crop and livestock diversity, forest products and biomass for fuel. Poor women regard safe and physically close access to potable water, sanitation facilities, and abundant energy supplies as crucial aspects of well-being.³⁷

The figure below illustrates the links between ecosystem services and human well-being.

Figure xx. Links between ecosystem services and human well-being (from Duraiaappah, 2002, cited in UNEP, Exploring the Links)

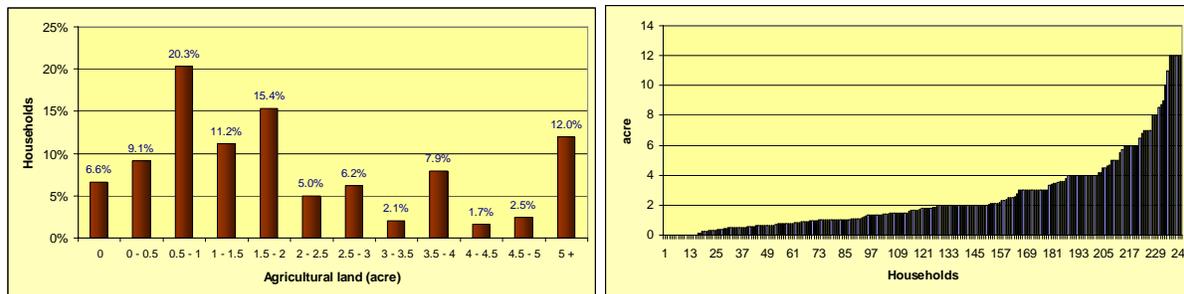
PE linkages are classically presented in this report under 4 categories: environment & livelihood, environment & health and environment & vulnerability, and environment & economic growth, as these aspects - sustainable livelihood, health, vulnerability and economic growth - are considered as inherent characteristics of poverty.

4.2 - Livelihoods and the environment

4.2.1 - Importance of natural resources for the poor

For the rural poor in Bhutan, natural resources and ecosystem services are their direct and only sources of livelihood. With only 8 per cent of the land arable, and very little potential - if any - to expand further because of the topographic conditions and loss of land to urbanization, a proportion of rural poor have landholdings too small to guarantee food security, let alone provide an adequate income, and some are landless.

Surveys undertaken in 2008 and 2009 under the Rural Economy Advancement Programme in ten different districts show the following distribution of agricultural land owned by poor households. 6.6 per cent of the households interviewed had no land at all, and 29.4 per cent had less than one acre of land. In some of the villages consulted, such as Samchoeling in Trongsa District, most of the poor households are sharecroppers who have to give up to 50 per cent of the harvest to the owners of the land, residents of other districts. Some households also lose their land when they are not able to reimburse money lenders. For all households interviewed access to natural resources is considered vital.



In addition of having land in areas of relatively low levels of biological and resource productivity, land degradation (due to erosion, loss of fertility, ... in part because of overgrazing, restriction on cattle rearing, ...), limited irrigation and limited mechanization (partly due to the topography and access to finance services) obviously leads to a poor agricultural productivity and production.

Similarly people, interviewed during the REAP surveys, continue to rely heavily on biomass fuels and traditional technologies for cooking and heating, and most villages visited had no access to electricity, and no alternative fuels options. Shortage of wood fuel imposes time and financial costs on poor households, putting a particular burden on those who are short of labor and making it harder for children to attend school.

Thus both environmental conditions and access to a variety of natural resources are crucial to the ability of poor people to sustain their livelihoods. Variety is important since the poor need to have options so that they can continually diversify and differentiate their use of available natural resources as environmental conditions change. This is something recognized globally³⁸. Natural resources and ecosystem services are a primary source of livelihood for the rural poor and can supplement households daily needs and income. Poor households derive a significant share of their incomes from natural resources (quantify from REAP surveys). The poorest are most dependent on environmental income in relative terms, but the somewhat better off could make more use of natural resources in absolute terms (confirm with examples).

³⁷ UNEP – Exploring the links. Full title.

³⁸ BDP, 2001; Koziell, 2001; Koziell and Saunders, 2001.

4.2.2 - Impacts of degradation of natural resources, biodiversity loss, loss & restriction of access, insecure land tenure on the poor

Natural resource degradation (through soil erosion and land degradation due to deforestation, overgrazing, ... but also through an increase of the use of natural resources linked to rising incomes, and to a certain extent due to the impacts of climate change) and biodiversity loss (agro-biodiversity, pest-resistant crops, livestock varieties, ...) are undermining the current livelihoods (reduced food production, reduction of alternatives) and future livelihood opportunities (through the loss of crop and livestock varieties for example). As detailed above the poor are usually the most affected, as they are left with little or no substitute. In some cases, the degradation of natural resources creates "poverty traps" when a vicious circle makes poor people even poorer, for example soil erosion, resulting from poor management of farm lands on steep slopes, increased deforestation and intensive farming, leads to a reduction in agricultural productivity, land lost to money lenders where they become unable to reimburse the loans contracted during the periods of food shortages, insufficient water renders the maintenance of livestock more difficult or impossible, resulting in reducing amount of manure for the fields, which in turn reduces further the agricultural productivity, ...

As indicated in the previous section, rising income could also tend to increase the use of natural resources, usually by outsiders, in particular if the access has improved; growth will not automatically alleviate environmental pressure in this context.

Poor people are affected by natural resource degradation and biodiversity loss much more than the better off because of their limited assets and their greater dependence on common property resources for their livelihoods. (provide examples from REAP surveys, figures, ...) In particular poor women are disproportionately affected by natural resource degradation and biodiversity loss. As they might have to travel greater distance to collect fuel, fodder, litter, ... due to growing resource scarcity or more restricted access to common property areas. This reduces the time spent on income-generating activities, crop production, and household and child-rearing responsibilities³⁹.

Restriction on access to common property resources and unclear tenure restricts and in some cases suppresses income from natural based livelihoods and can lead to degradation of resources. Insecurity of land tenure (for example sharecropping) almost always leads to farmers not investing in soil conservation measures (overgrazing and soil erosion, reduction of biodiversity, ...).

4.2.3 - Reducing poverty by improving natural resources management

Working on the positive linkages between environment and poverty can demonstrate (1) that poverty and population growth do not fatally lead to environmental degradation, and (2) that the poor can be the agents of management of the natural resources they rely on. A lot of experience and lessons are available from the Integrated Conservation and Development Programmes implemented the National Parks on improving livelihoods of people in and around parks, and also from the other technical programmes of the Ministry of Agriculture and of other sectors.

There are a number of ways to address this in a way beneficial for both the environment and pro-poor growth:

- Improving agricultural (crops and livestock) productivity & diversifying agricultural production;
- Reducing soil erosion and land degradation;
- Securing a sustainable access to land and clarifying land tenures arrangements;
- Securing access, under certain conditions, to natural resources;
- Providing alternatives to natural resources;
- Securing access to markets; and more generally by
- Developing sustainable livelihoods, which is what REAP is trying to do.

These are detailed further under the sectoral section of the guidelines, under section xx.

4.3 - Health and the environment

4.3.1 - Importance of environmental health in poverty reduction

Environmental degradation has been demonstrably linked to human health problems, including some types of cancers, vector-borne diseases, emerging animal to human disease transfer, gastro-intestinal diseases, nutritional deficits and respiratory illnesses.

A significant proportion (to quantify) of diseases may be associated with environmental risk factors, representing more than xx percent of the major diseases and xx percent of all deaths. The most obvious and easy to tackle are diarrhea, lower respiratory infections, other unintentional injuries, and malaria and dengue.

Major environmental health risk factors are: poor water quality and quantity, inadequate sanitation and waste disposal, indoor air pollution (caused by the burning of traditional biomass fuels for cooking and heating), outdoor air pollution (industrial and urban), exposure to disease vector (malaria, dengue, ...), and agro-industrial chemicals.

It is widely believed that important health burdens are likely to be worsened by climate change⁴⁰.

³⁹ Again, this is widely recognised in many developing countries. See Brocklesby and Hunshelwood, 2001; Dasgupta and Das, 1998.

⁴⁰ Campbell-Lendrum & al, 2007

Inadequate access to safe drinking water and sanitation, combined with poor hygiene practices, are major causes of ill health and life-threatening diseases (malaria, dengue, typhoid, ... **quantify once data become available**). **XX** per cent of rural poor rely on natural water sources such as streams for their washing and drinking water. Water-related diseases, such as diarrhea, typhoid, **other** impact **xx** people a year, **xx percent** of whom are children under the age of **xx**. Vector-borne diseases linked to environmental conditions, such as malaria and dengue impact **xx** people a year, **xx percent** of whom are children under the age of **xx**.

Indoor air pollution caused by the burning of traditional biomass fuels for cooking and heating affects **xx** people, resulting in premature death for an estimated **xx** women and children each year. Women and children are more exposed to indoor air pollution, since they traditionally spend more time indoors and near the stove.

Outdoor air pollution, associated with industrial development, quarrying, mining, can also be a significant health issue outside of urban areas. **Quantify with data, in particular recent dust issues.**

Pesticide poisoning and exposure that can result in either acute illness or chronic health impacts (**any data available?**).

These diseases and death can be prevented through environmental modifications (such as provision of safe water, improved sanitation, and adequate hygiene).

Environmental Health

Health outcomes that are a result of environmental conditions are classified under the category of “environmental health”. The World Health Organisation has defined **environmental health** as those “aspects of human health, including quality of life, that are determined by chemical, physical, biological, social and psychosocial factors in the environment”.

In general, environmental health risks are grouped into two broad categories: **Traditional hazards** are closely linked with poverty. They refer to health risks that are a consequence of lack of access to clean water, inadequate sanitation, poor waste disposal, indoor air pollution and vector-borne diseases such as malaria. **Modern hazards** include urban air pollution and problems arising from industrial chemicals and wastes.

Source: Poverty, Health & Environment. Placing Environmental Health on Countries’ Development Agendas. Poverty-Environment Partnership. 2008.

Better environmental health conditions go beyond direct health outcomes for current and future generation and can contribute to the reduction of several dimensions of poverty. The main benefits include:

- (a) saving time;
- (b) lowering cost of living;
- (c) increasing gender equality;
- (d) increasing convenience through service provision (recycling, building latrines, etc);
- (e) reducing the burden of daily life (for example, through improved water and sanitation facilities easing water collection, replacement of fuelwood by alternative fuels);
- (f) reducing the part of malnutrition that is a consequence of bad sanitation and repeated infections (World Bank 2006d in Health report);
- (g) improved cognitive learning and achievement of satisfactory educational levels that will then impact future work productivity and stop the intergenerational transmission of poverty;
- (h) improved productivity, performance and economic growth.

Cairncross & Kolsky (2003) highlight several reasons why environmental health is important to the poor and can have an impact on poverty reduction. They include the following:

- Poor people can live in areas with difficult environmental conditions and more difficult access to medical services;
- The poor are more vulnerable and exposed to environmental disease and have lower resistance to infection;
- Diseases contribute to poverty: When poor fall ill, they lose their income. Children with intestinal worms may be stunted in their growth or impaired in their intellectual performance. Improving environmental health would also reduce vulnerability to other opportunistic infections and diseases.

4.3.2 - Linkages between poverty and environmental health

The table below presents examples of linkages between environmental health and poverty linkages.

Examples of Environmental Health and Poverty Linkages

Themes	Linkages
Water supply & sanitation	Lack or inadequate water supply & sewage treatment infrastructures leads to increased risk of water-related disease; early childhood diarrhea leads to lower education & cumulative earnings. Poor people spend more of their resources for drinkable water (not only in financial terms, but time spent for example for firewood collection, ...).
Indoor air pollution	Burning biomass in poor households for cooking and heating purposes leads to increased risk of acute respiratory infections.
Industrial & municipal waste	Uncollected household waste increases rodent infestation and provides a breeding ground for flies, which leads to environmental health problems. Contamination of surface water, groundwater, and soil results in health risks. Leaching from unsanitary landfill sites contaminates water resources and causes health risks.
Malaria and dengue	Vector-borne diseases such as malaria and dengue are linked to a wide range of environmental conditions related to mosquito breeding, including irrigation, poor drainage, and stagnant water.

Air pollution	Emissions from transport and industrial sources are contributors to respiratory disease burden and premature deaths.
Institutional development	Inadequate institutional capacity and legal frameworks underlie the specific environmental health and poverty issues described above.

Source: From Dale, 2005, presented in Pov Env CRA.

4.3.3 - Addressing environmental health issues important to the poor

Once the linkages are identified, addressing the environmental health issues important to the poor, in a way which is beneficial for both the environment and the poor, is - in theory - relatively simple. The following table presents the various options available.

Themes & Issues	Possible interventions
Water supply & sanitation: Inadequate, leading to water-related disease & waste of resources (time, fuelwood, ...)	<ul style="list-style-type: none"> • Ensure proper watershed management and proper practices • Ensure proper maintenance of existing water supply & sewage treatment infrastructures • Ensure proper design of new water supply infrastructures, including rain harvesting • Better sanitation facilities at school for boys and girls • Provide filtering systems enabling consumption of water, without having to boil it (at household and school levels) • Promote better waste management techniques.
Indoor air pollution: increased risk of acute respiratory infections	<ul style="list-style-type: none"> • Promote further the use of improved stoves and restrict fuel wood collection to dedicated community forests, and if they do not exist, create them. • Promote the use of alternative fuels, ensuring that these alternatives are readily available, convenient to transport and provided at an affordable price.
Outdoor air pollution: increased risk of respiratory infections and impacts on crop production	<ul style="list-style-type: none"> • Ensure that measures which should be part of the environmental management plan of the industrial activities are properly implemented and that compensation measures are provided to the impacted households if these are not, in addition to possible fines and request of corrective measures to be taken.
Malaria and dengue	Control mosquito breeding grounds (including irrigation, poor drainage, stagnant water, ...) through regular awareness campaign.

What is equally important is to integrate the environmental health issues important to the poor in national and local strategies and plans. This is further developed under the sector section.

4.4 - Vulnerability and the environment

4.4.1 - Vulnerability to unpredictable events and Poverty

Insecurity and vulnerability to unpredictable events are important concerns of poor people, directly as they are left without safety nets to cushion them against such unpredictable events, and indirectly because reconstruction costs could divert limited resources from poverty reduction programmes. Insecurity relates to people's risk of exposure, susceptibility to loss, and capacity to recover. Insecurity and vulnerability to unpredictable events originate, in Bhutan, from environmental stress and shocks. These stresses and shocks will be exacerbated by climate change.

"Natural disasters are a risk factor, which affect the pace of economic growth and destroy the assets of the poorest segments of the population in affected areas, reducing them to a state of dependency, at least temporarily, on donations ... natural disasters seriously affect the living conditions of affected populations, and constitute an obstacle to a definite break with certain degrees and patterns of poverty. Therefore measures aimed at managing the risk are of the utmost importance." Mozambique Action Plan for the Reduction of Absolute Poverty, 2001-2005.

4.4.2 - Linkages between environmental vulnerability and poverty

The following box presents the various linkages between vulnerability, poverty and environment.

Environmental stress and shocks & Poverty

Resource mismanagement and environmental degradation can exacerbate the frequency and impact of droughts, floods, forest fires, and other natural hazards. Shocks relate to environmental disasters, while stresses refer to gradual processes of environmental degradation.

By worsening economic deprivation in the short term, environmental disasters can compromise long-term welfare by forcing affected households to sell assets that would otherwise be used to meet future needs and contingencies.

The effects of droughts and long-term land degradation are felt more gradually. They may build up over several years, during which a household's accumulated reserves are run down as a result of recurrent years of poor production. This will result in a slow but inexorable inability to invest in production and often leads to impoverishment and the abandonment of land.

The environmental stresses (increasingly fragile environments, natural hazards, changing climatic conditions, unpredictable seasons) make livelihood tasks more time-consuming, more dangerous, more costly, and require more inputs. Poor people highlight their dependence on the diversity of common property or open access resources - grazing lands, water bodies, and forests and the variety of products they hold - as a safety net during hard times. A decline in the abundance and diversity of these resources reduces people's livelihood options and increases their vulnerability.

Environmental degradation and disasters can cause their victims to migrate in search of better conditions, returning, or not, after the event. Globally, the Red Cross estimated that 1998 was the first year in which the number of refugees from environmental disasters exceeded those displaced as a result of war.

The frequency, intensity, and duration of extreme weather events is likely to increase as a result of climate change, and as a result food insecurity, spread of vector-borne disease, flooding and land degradation will increase.

Poor people use a range of coping mechanisms and survival strategies in the face of environmental degradation and disasters, but their capacity to mitigate and recover from disaster is often constrained by the wider policy and institutional context, in addition to factors related to their social and economic status. Informal institutions such as local social networks are important and their density and capacity can underpin the ability of the poor to cope.

Crisis and conflicts

Tensions between diverse interest groups over natural resources on which the poor directly depend for their livelihoods can contribute to conflict. In such circumstances, the poor are usually the most negatively affected because they have the fewest resources to cope with physical loss, and they are the most vulnerable to violence and lack appropriate means for legal redress.

Source: WB Exploring the links

4.4.3 - Reducing environmental vulnerability and poverty

Addressing vulnerability, environment and poverty in a mutually beneficial way could be done through:

- An active prevention of environmental degradation in areas susceptible to environmental stress and shocks;
- Environmental restoration activities in areas that have been severely impacted by environmental stress and shocks;
- Providing safety nets to the population impacted and in particular the poor, through compensation and mitigation;
- Setting up Institutional arrangements and funding mechanisms for such activities;
- Ensuring that the importance of access to natural resources is taken into consideration in particular during the development of large natural resources type project (plantations), and infrastructure projects (hydropower in particular).

4.5 - Economic growth and the environment

4.5.1 - Importance and challenges of good environmental management for a sustainable pro-poor economic growth

We have seen in section 3.2 above the significance of the environment for economic development in terms of generating economically important goods and services. These goods and services translate into sources of livelihoods, revenues and employment for a large proportion of the population. The environment, and its integrity, directly affects growth of the hydropower, the

agriculture, and the tourism sectors. Similarly, environmental degradation leads to decline in productivity, which in turn affects the growth of the economy.

While there is no simple relationship between growth and environment, there are many examples of how bad environmental management is bad for growth. These short-run growth paths are not only bad for long-run growth, but also have high social and environmental costs that disproportionately affect the poor. For example, flooding downstream can be caused or exacerbated by deforestation upstream, landslides and flash-floods be magnified by improper infrastructure development, reduction of storage of reservoir be a consequence of increased upstream erosion and sedimentation, inappropriate waste management can lead to pollution having an impact on human health, ...

Thus environmental improvement is not a luxury preoccupation that can wait until growth has alleviated income poverty, nor can it be assumed that growth itself will take care of environmental problems over the longer term as incomes rise and more resources are available for environmental protection. Countries with similar levels of income and growth can have quite different levels of environmental performance, and countries can have simultaneously high levels of growth and improved environmental performance.⁴¹ There is no simple tradeoff between growth and the environment. Ignoring the environmental soundness of growth - even if this leads to short-run economic gains - can hurt the poor in the short term and undermine long-run growth and its effectiveness in reducing poverty. What matters is the quality of growth, something that is well encompassed into the concept of Gross National Happiness.

There are two ways in which the environment can contribute to pro-poor growth: (1) Through national economic growth, which creates jobs, add to total income and Government revenues, which in turn be used to help the poor; and (2) through the development of small & medium-scale enterprises owned and managed by primary producers and processors of natural resources. These objectives are not always compatible, and a right balance needs to be set amongst these. For example:

- Hydropower and mining can come to dominate remote areas home to poor population, depriving them from their source of livelihood. Harm can be avoided by careful zoning, local hiring and procurement policies, management agreements and earmarking some of the profits for local-level investments and proper management of the watershed.
- Tourism can generate, at the local level, entrance fees contributing to development activities undertaken at the local level.
- Protected areas can be managed in ways that ensure poor people still receive substantial benefits and are compensated for any loss of natural resources use rights.

4.5.2 - Linkages between poverty, economic growth and the environment

The linkages between poverty, economic development and the environment are presented in details in section 3, in terms of employment, livelihood, revenues, government incomes, ...

They are summarized on the figure below.

Prepare figure

4.5.3 - Improving environmental management to ensure a pro-poor economic growth

The strong emphasis on protecting and conserving the environment, that Bhutan has always enjoyed, is kept in the 10th FYP. We have seen above the importance of the environment in the economy of Bhutan, directly and indirectly, and its large contribution in the wealth of the country. The challenge is very much to ensure that the long term economic profits derived from natural resources are maintained and properly used as a source of development finance, saving it and investing it into produced and human capital (see section 3.1 above). The 10 FYP recognizes that the environment sector will require more attention than before in view of the accelerated pace of development activities accompanied by increased expansion of infrastructure development, urbanization, industrialization and consumption patterns (see figure below) likely to put an even greater burden and stress on the natural environment⁴². Additionally, environmental conservation imperatives will be increasingly challenged by the need to balance it judiciously against the urgency of sustaining and improving rural livelihoods and reducing poverty. Close attention will also be required to ensure that the costs of environmental conservation do not fall disproportionately on the poor through crop loss or limited access to forest resources or cultivable land.

Figure showing the evolution of the number of industries, farm roads and feeder roads, waste disposal related to urbanization, urban centers, hydropower capacity, mining, number of cars, etc for the last ten years.

As the protection and conservation of the environment has always been a key component of the five-year plans, numerous instruments currently exist to ensure that economic development is not done at the cost of the environment and that undesirable impacts are properly avoided, mitigated and compensated. These instruments are summarized in box xx. They provide the overall framework for the assessment of projects on the basis of their environmental impacts, and to some extent, on the basis of their social impacts. They are in no way intended to hamper socio-economic development, but to provide guidance on making the right investments considering the full environmental and social impacts of such projects.

⁴¹ WB. Linking poverty reduction and environmental management.

⁴² 10FYP.

Existing instruments to ensure a pro-poor and environmental friendly economic growth

National Environment Protection Act

Environmental Assessment Act 2000

Regulation for the environmental clearance of projects & regulation on Strategic Environmental Assessment (2002)

Environmental Codes of Practices:

- Storm water drainage systems (Aug 2004)
- Tourism activities (Aug 2004)
- Installation of underground and overhead utilities (Aug 2004)

Sectoral Environmental Assessment Guidelines:

- Mine (Aug 2004)
- Highways and Roads (Aug 2004)
- Industrial project (Aug 2004)
- Hydropower (Aug 2004)
- Transmission and distribution lines (Aug 2004)
- Forestry (Aug 2004)
- Urban development (Aug 2004)
- Tourism (Aug 2004)

Waste prevention and management Act (2009)

These instruments are regularly updated to take into consideration the experience accumulated, the emergence of new technologies and the development of international best practices. A point of importance that will be discussed further in details in the sectoral section of the guidelines relates to the strengthening of the implementation of the related plans, and of their monitoring and the identification of the responsible parties for their implementation, monitoring and funding.

Numerous recommendations were made in the Bhutan Environment Outlook 2008, targeting land, water, air and biodiversity, to address perceived gaps. Because of their relative and absolute importance, the following issues will need to be given particular consideration to guarantee that economic growth is pro-poor and environmentally sustainable:

- Development of a code of practice for sustainable hydropower development⁴³, aiming at addressing all environmental and social issues in an holistic way, with the objectives to minimize environmental and social negative impacts and to maximize the benefits that such projects can have on the socio-economic development of the impacted areas. To achieve this it will be necessary to streamline the preparation of the Environmental and Social Impact Assessments, of the environmental and social management plans, including the ones looking at the environmental and social impacts of construction activities, and the contractualisation of the various environmental and social obligations. Bringing these projects in line with the best practices of the industry could also widen the range of potential investors and accelerate the hydropower development in the country, and therefore to a pro-poor economic growth, including creating numerous employment opportunities.
- Considering the magnitude of the proposed development of hydropower, it will quickly prove necessary to develop integrated water resources management plans, taking into consideration the multiple uses and functions of water resources. Cumulative impact assessments of such projects should also be undertaken to look at the impacts of all projects (not only hydropower) in a river basin. The protection of a number of critical river basins from hydropower development could also be considered to conserve critical habitats.
- Considering the focus put on the development of the infrastructure, it might be necessary to strengthen the implementation of the existing codes of practice for these activities and to promote environmentally friendly road construction methods. Demonstrating that such EFRC methods are cheaper in the long run, and have significantly less impacts on the environment will be a very strong argument in favour of such techniques. Similarly, the use of bitumen emulsions instead of traditional bitumen should be encouraged, as this will not only reduce air pollution along road construction sites but also bring about a drastic reduction in the demand for firewood and also protect the health of the workers.
- On a general note, social impacts of development activities will need to be further mainstreamed into the development of the various projects.

⁴³ In particular for the large projected projects.

Economic returns from environmental investment

(source: Making the economic case primer).

Natural capital generates a flow of benefits. Just as the environment base should be seen as an economic asset, so there are tangible economic returns from investing in it. Conversely, running down this stock of natural capital imposes costs and losses on most sectors of the economy, and undermines pro-poor economic growth. If managed sustainably, the environment base will continue to yield economically productive and beneficial flows of goods and services. If used and managed unsustainably, these economic benefits will progressively be lost.

The return from environmental investment is the flow of economically important goods and services that the environment yields. These extend beyond the commercial raw materials and physical products that conventionally dominate official statistics on the environment sector. Many decision-makers would see the value of a forest, for example, as comprising only its large-scale timber potential; or the value of grasslands as limited to livestock production possibilities. In many cases, considerations of sustainability would also not be factored into decisions—for example the revenues from gross extraction or clearfelling, not the economic value of ecosystem services and sustainable harvesting.

Environmental investment also yields a wide range of other economic benefits, including flows of products which are used at the subsistence or small-scale level (such as firewood or food) as well as services which underpin other productive activities and provide vital life support (such as the human health benefits of clean water and air, protection against disasters, maintenance of waterflow, or protection against the impacts of climate change and climate variability). The value of these goods and services however remains largely hidden in most official development statistics.

There are three main reasons why it is important to explain and emphasise the full range of both “visible” and “hidden” benefits as the economic return on environmental investment:

- 1 This presents a more complete picture of the economic importance of the environment, and of the high and wide-ranging costs associated with environmental degradation and loss. It is important that decision-makers are aware of and appreciate the full—and diverse—range of values associated with environmental investment.
- 2 The focus on only commercial values has in many countries led to a situation where development and economic policy have placed undue emphasis on maximising the quantity of products extracted from the environment, even when these uses are not sustainable and may not even be optimal in economic terms. It is important that decision-makers understand that extractive commercial uses are only one option among many when seeking to maximise the economic returns from environmental investment—and often benefit the richer groups in society who are able to access and gain from these commercial benefits. If environmental assets are not managed for the long term, and are exploited only for short-term gain, they may never allow for economic development on the scale or of the type required to reduce poverty or to benefit the poor.
- 3 “Hidden” environmental goods and services are especially important for the poorest and most vulnerable sectors of the population. In many cases, alternative sources of essential goods and services are simply not accessible or affordable elsewhere for them, and they suffer disproportionately in health, economic and general wellbeing terms from environmental degradation and loss. It is important to underline to decision-makers that there is a very direct link between the return on environmental investment, and the welfare and survival of the poorest.

PART B: MAINSTREAMING THE ENVIRONMENT FOR PRO-POOR GROWTH & DEVELOPMENT

2.1 - Defining Mainstreaming

Poverty-Environment Mainstreaming is defined as integrating poverty-environment linkages into national development planning processes for poverty reduction and pro-poor growth. It involves (1) establishing the links between environment and poverty and (2) identifying the (a) policies and (b) programmes to bring about better pro-poor level implementation - reflecting the need to integrate the valuable contribution of environmental management to improved livelihoods, increased economic security and income opportunities for the poor which is usually largely overlooked in government policy making processes.⁴⁴

Poverty-environment mainstreaming means more than the existence of a chapter in the Five-Year Plan, or the frequent reference to environment and poverty in the document. Mainstreaming is a process, which is used to signify (1) the description of the environmental issues and opportunities; (2) the analysis of the links between poverty and environment; (3) the design of responses to meet the identified challenges; and (4) the inclusion of the environmental constituency in the processes leading to the design and implementation of the Five-Year Plan.

2.2 - Importance of Mainstreaming

Although a number of environmental issues needs to be addressed with a sector approach for a number of reasons (to reach a critical mass, to avoid dispersion of resources (human and financial), to wear a real weight in the decision making processes guaranteeing that environmental issues - but also social issues - are taken with the same weight as technical and financial issues for example, resources, for accountability reasons, for budget allocation, ...), the interactions that have been demonstrated above between environment, poverty and economic development, are so strong that a sectoral approach, only, will fail at looking at issues in an holistic manner, and could end up achieving the targets of one sector at the cost of the other sectors. For example, suppression of diseases vectors could be done at the cost of the pollution of aquatic habitats, hydropower development could marginalize further communities by destroying their traditional livelihoods, etc.

2.3 - How to mainstream environment for pro-poor growth & development

The planning process for poverty reduction and pro-poor growth, under the 10th Five-Year Plan, initially scheduled to cover the period from 2007 to 2012, started in 2006. Guidelines⁴⁵ were issued in March 2006, presenting both the process and the product that was expected. The 10FYP was finalized at the beginning of 2009 and covers the period from 2009 to 2013. The preparation of the 11th FYP will start around 2011, and by that time these Poverty-Environment Mainstreaming guidelines could be integrated into the overall planning guidelines.

As plan is already prepared, the focus of these guidelines will be more on the implementation and the monitoring.

PART C: POVERTY-ENVIRONMENT LINKAGES IN PLANNING, BUDGETING & MONITORING

1 - Poverty-Environment Linkages of Particular Importance

1.1 - xx

xx.

2 - Poverty-Environment Linkages in the 10FYP and development planning processes

2.1 - Review of achievements and linkages

2.2 - Development Planning Processes

3 - Public Expenditures on Environment

THIS SECTION WILL BE PREPARED UPON COMPLETION OF THE ASSIGNMENT ON THE ANALYSIS OF STATUS & TRENDS OF PUBLIC EXPENDITURE ON ENVIRONMENT.

3.1 - xx

xx.

3.2 - xx

⁴⁴ UNDP-UNEP Poverty Environment Initiative website.

⁴⁵ Guidelines for the preparation of the 10th FYP. [Check full reference.](#)

xx.

3.3 - xx

xx.

4 - Poverty-Environment Indicators

4.1 - Why having PE mainstreaming indicators?

The impact of PE mainstreaming can only be measured if appropriate performance indicators are available. Indicators are a valuable tool for tracking progress against policy targets and objectives, for promoting greater accountability and public engagement in the implementation of programmes, and for analyzing and understanding social conditions, trends and change. They assist decision-makers and the public to monitor whether and in what form change is happening, to prompt for appropriate response strategies, and - if the indicators were established in relation to a clear goal and target - to evaluate whether that change is good or bad. Indicators also facilitate comparison with the performance of others.

The primary focus of PEM related indicators is on measuring progress towards a better integration of poverty-environment issues into policies, strategies and plans, and of their successful implementation, i.e. to monitor poverty reduction that results from environmental changes.

Benefits of PEM indicators

Properly planned, developed, implemented and monitored, indicators can make a critical contribution towards decision policy development. The benefits include:

- Facilitating the monitoring and review of progress in achieving key objectives and targets;
- Allowing effective reporting to decision-makers and the public, thus encouraging accountability;
- Clarifying the meaning and application in practice of PEM;
- Contributing to the revision of existing strategies and action plans, and the development of new plans;
- Raising the political and public profile of PE mainstreaming issues;
- Encouraging meaningful dialogue on PE mainstreaming.

Source: Adapted from UNEP, Guidance Framework for SCP indicators.

4.2 - Various types of indicators & methodologies

Indicators can be used at different scales, for different purposes and in a number of different ways. At the national, and district level, poverty-environment trends can be monitored over time and across geopolitical categories. There are numerous existing methodologies:

- Indicators can be individual;
- The OECDs Pressure-State-Response model is a relatively straightforward framework for monitoring the impact of resource degradation on the poor and helping in identifying policy measures to stem the problems faced by the poor. It considers key environmental problems, identifies driving forces that are leading to pressure on natural resources, tracks the state of the resource, and then identifies mechanisms that have been or can be put into place in response.
- A slight modification to this model allows tracking the poverty impact of degradation. Priya Shyamsundar called it the Pressure-State-Poverty-Response model⁴⁶.
- Poverty-Environment Maps: Geo-referenced indicators are equally a very useful tool for monitoring the impact of natural resource degradation on poverty. Henninger and Hammond (2000) consider that they are especially useful for the following reasons:
 - Many environmental problems manifest themselves spatially and can be very local in their nature. Geographic mapping of environmental conditions makes it feasible to understand environmental conditions and act on them locally.
 - Maps showing poverty rates and environmental data can become important tools for screening and geographic targeting of interventions schemes. The complex nature of poverty-environment interactions make it useful to understand geographically a) where poverty exists, and b) the nature of environmental conditions in those poverty pockets. These maps can help pinpoint areas for more in-depth analyses.
 - Electronic maps are now very easy to prepare, with GIS tools and remote sensing products widely available, affordable, and easy to use. GIS have become a very convenient way to store and analyse data from different sectors and at multiple scale.

⁴⁶ Full reference of WB paper #84.

- Poverty-Environment maps prepared from GIS are usually a very good way to present ideas to policy makers.

Because of the ease of use, to test easily various hypotheses by using different layers of information and to correlate various variables, these geo-referenced indicators are very suited to track poverty-environment issues.

If some indicators are at the national and district levels, some are at the project level, and can monitor inputs, outputs, outcomes and overall impacts. While input and output indicators can be referenced as intermediate indicators; outcome and impact indicators are seen as final indicators. In the guidelines we only focus on the final indicators.

4.3 -Developing PE mainstreaming indicators

The PE literature has not come yet with a systematic review of internationally recognized and nationally developed, and used, PE mainstreaming indicators. Development and refinement of PE mainstreaming indicators is usually part of the second phase of PEI projects⁴⁷, and are developed through extensive research and consultations. This should be the case for the project in Bhutan. What will be attempted here is to provide general indications on how to initiate this work, in particular during the consultations with the sectors.

There are a number of critical challenges one usually faces when developing indicators:

- Keeping the indicators small in number, while at the same time covering an adequate spectrum of issues;
- To the extent possible, identifying indicators that are relevant to Bhutan's specific challenges, yet are compatible with international commitments and facilitate comparison between states;
- Providing meaningful information on trends to decision-makers;
- Identifying indicators that are measurable in the context of the resource constraints that may prevent access to useful data;
- Understanding the information that should be deduced from the direction the indicator is moving in, as there might be, especially in the case of PE mainstreaming indicators, different signals suggested by the trend. For example, an increase in the use of agricultural fertilizer could suggest enhanced agricultural productivity and an improvement to food security, yet this could also have implications for water quality and human health.
- Recognising that there might be conflicting political priorities that seek to drive the indicators in different directions.
- Ensuring that there are sufficient resources for regular monitoring of the indicator, so that appropriate response measures can be undertaken.
- Being able to identify the underlying driver for the trend.

Some guiding principles could be used during the development of the indicators, as presented in the box below.

Guiding principles in the development of the indicators

- Whenever possible, link to existing indicators;
- Agree on the level of aggregation: aggregated indicators can give a clearer picture of where the country as a whole is heading. Disaggregated indicators relating to certain themes and sectors might carry more methodological weight, but can tell a mixed story when some indicators are moving in one direction and some are moving in another direction;
- Recognise the limitations and provide detailed explanations for each indicator to ensure that they are not misunderstood or used inappropriately. It is also important to be clear about the potential limitations and uncertainties of the different indicators;
- Recognise the need to balance absolute or directional targets;
- Adopt a structured screening and selection process.

Source: Adapted from UNEP SCP indicators

It is certainly more useful for policy-makers to develop their own set of indicators based on an informed understanding of the practical implications of PE mainstreaming, and with the goal of ensuring that the indicators are specifically tailored to the information needs, sustainability priorities and national frameworks and strategies of the country.

⁴⁷ UNEP Mainstreaming Poverty-Environment linkages into development planning. A handbook for Practitioners.

Development of PE Mainstreaming Indicators.

The approach for the development of the indicators follows the successive steps: plan, develop, implement and monitor (evaluate the efficacy of the indicators).

Plan: Clarifying the context

The first step is to clarify the context in which the indicators are to be used and applied. This involves considering the key goals and objectives of the indicators, identifying the target end-user, and assessing the nature of existing resources.

What is the underlying scope and purpose of the indicators?

- Are we clear about the key goals and objectives for these indicators?
- Is the thematic scope of the indicators clearly defined?

Who are the target end-users?

- Are we clear about the target end-user for the indicators?
- Who should consider this information? For what purpose?
- What are the implications of the target user-group and end-purpose for designing the indicators?

Where are these indicators to be applied?

- Is the geographic scope of the indicator framework clearly defined?
- Does it relate to reporting at the national, local or regional level?

When (over what time frame) are they applicable?

- What are the timeframes for monitoring and reporting on the indicators?
- Have appropriate baselines dates been defined? Are these consistent across indicators?

How are they to be applied?

- What existing resources can be drawn on for accessing data?
- What partnerships would make this easier?
- Would it make sense to introduce a pilot programme?

Develop: Identifying the indicators and indicator framework

Source: SCP UNEP

4.4 -Some PE mainstreaming indicators

A number of intermediate and impact indicators are presented below, adapted from various publications, in particular from the WB Paper #84 of the WB environmental economics series, poverty-environment indicators, prepared by Priya Shyamsundar. These indicators will be discussed, refined and adapted during the consultations with the various sectors, on the basis of the guidance provided above and on the availability of existing data sets. It is essential that the various indicators be linked to poverty, to be able, for example, to answer the following question: Do the poor disproportionately bear most of the health costs of environmental degradation? To do this it is important that the various indicators be disaggregated by income, by wealth or by an aggregated index of poverty, whatever is the simplest on the basis of availability of data. It is also important to identify which of the many indicators are the most important ones for monitoring the various outcomes, based on data availability, cost and ease of measurement and monitoring, perceptions of the stakeholder on what is important to monitor and acceptance of the indicators, and the final purpose for which the information is used.

The table below presents potential poverty-environment indicators. These poverty-environment indicators will change when a better management of a natural resource leads to a decline in poverty.

Natural resources and livelihoods issues/dimensions relevant to poverty

Examples of PE indicators

Natural resource degradation

- Soil erosion & land degradation due to deforestation, overgrazing, poor management of farm lands on steep slopes, climate change, ...
- Increased use of natural resources linked to rising incomes
- ...

Percentage of poor households involved in soil conservation activities.
Percentage of poor households involved in soil restoration activities.

Biodiversity loss

- Agro-biodiversity (crop and livestock varieties, ...)
- Natural biodiversity by pressure on natural ecosystems

Number of species and varieties used by the poor households.

Loss and restriction of access to agricultural and forest lands

- Conversion of agricultural lands to other land uses
- Loss of access to common lands
- Intensive contract farming leading to loss of access to common lands
- Land loss to money lenders
- Insecure land tenure linked with sharecropping

Percentage of common lands lost to other usages by poor households.
Percentage of land lost to money lenders amongst the poor.
Importance of sharecropping for the poor.

systems, ...

Limited crop diversification and marketing

Food security

Quantity of household consumption that is derived from forest products by income quintile

Income and opportunity

Time spent by household members to collect water and fuel wood

Quantity of annual household consumption derived from common lands

Quantity of annual household consumption derived from forest products

Percentage of irrigated area in total cultivated area by income categories

Environmental Health issues and dimensions

Water supply & sanitation

Examples of indicators

Percentage of poor households without access to an adequate and safe water supply

Percentage of poor households without access to an adequate sanitation system

Adequacy of sanitation at school by community poverty criteria

Time spent in collecting water by income quintiles

Percentage of fuel wood used by poor households to provide safe drinking water

Indoor air pollution

Distribution of households using LPG & clean fuels by income quintiles

Distribution of fuels usage per poverty status

Distribution of use of improved stoves by incomes quintiles

Availability of ventilation in cooking areas

Children sleeping in cooking areas

Industrial air pollution

Percentage of dust emitting industrial plants with proper dust reduction devices and practices

Malaria

Prevalence of malaria amongst the poor (geographical mapping required)

Proportion of households using bednet amongst the poor

Malaria cases and death rates among various target groups

Vulnerability to unpredictable events issues and dimensions

Examples of indicators

Direct exposure to environmental stresses and shocks.

Percentage of loss of land caused by landslide or severe soil erosion and degradation by the poor

Number of deaths from natural disasters by income quintiles

Households rendered homeless from floods/landslides/... per year by income quintiles

Percentage of areas prone to landslide owned by the poor (mapping of such areas is a prerequisite)

Percentage of farmers with land on slopes (different categories) by income quintiles

Loss of access to natural resources, acting as safety nets, because of large industrial projects.

Extent of compensation and mitigation provided to the population, directly and indirectly, impacted by large scale projects.

Economic growth

Significant part of the GDP coming from RNR sector
The environment sector as a major source of employment
Natural resources, a major source of revenues

Examples of indicators

Overall figure and importance for the poor

PART D: MAINSTREAMING POVERTY – ENVIRONMENT BY SECTOR

1 - Mainstreaming into policies, strategies, plans

1.1 - At the central level

1.2 - At the Dzongkhags and Gewogs levels

2 - Mainstreaming Poverty - Environment in the Natural Resources Sector

3 - Mainstreaming Poverty - Environment in the Trade, Industry, Tourism & Mines Sector

4 - Mainstreaming Poverty - Environment in the Energy Sector

5 - Mainstreaming Poverty - Environment in the Education Sector

6 - Mainstreaming Poverty - Environment in the Health Sector

7 - Mainstreaming Poverty - Environment in the Infrastructure Sector

8 - Mainstreaming Poverty - Environment in the Urban Development Sector

9 - Mainstreaming Poverty - Environment in the Transport Sector

REFERENCES