

Poverty-Environment Gender Linkages



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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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FOREWORD

“We must first eradicate poverty before we can worry about the environment!”

“On the contrary: environment degradation is the major cause of poverty in the first place!”.

Both sides are right to some extent. But these simplifications- and the resulting polarised debate- do not get us very far. Yet we all share the objective of reducing poverty in a lasting manner, and there is nowadays wide agreement in the development community that the environment is crucial for the sustaining of livelihoods. And once we realise that “the environment” actually means soil- to grow food; water- to drink, wash and irrigate crops; and air to breathe, and a host of natural food and medicinal products, it becomes clear that preserving “the environment” actually means safeguarding food production; sustaining livelihoods and preserving health. Poverty reduction, economic growth and the maintenance of life-supporting environmental resources are therefore inextricably linked.

Many of the policies and other factors underlying poverty and environmental degradation are likewise closely linked. They originate in policies and governance structures at the local, sectoral, national and even international levels. Too often, inappropriate policy and regulatory frameworks prevent the poor- most notably women- from developing their capabilities and productive potential, and protecting the natural resource base on which they depend. Reducing poverty thus implies tackling the underlying causes, recognising that the poor are active part in the solution of both developmental and environmental problems.

This document is the result of efforts by the DAC Working Party on Development Co-operation and Environment to clarify the key linkages between poverty and environmental degradation, with special attention paid to their gender dimension - and the policy implications at the local, sectoral and national levels. The objective is not to provide a comprehensive coverage of all pertinent issues, but to provide an analytical road-map which could be used as reference for more detailed sector and country-specific examinations. As such, the document complements other recent DAC Work in the area of poverty and sustainable Development and in particular the recent DAC Guidelines on Poverty Reduction and DAC Guidelines on Sustainable Development Strategies.

It is hoped that this work will foster a clearer understanding of the key issues at the interface between poverty and environmental degradation and the formulation of effective strategies for the long term, sustainable eradication of poverty.

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POVERTY-ENVIRONMENT-GENDER LINKAGES

INTRODUCTION

“Poverty and environmental degradation are causally interlinked”

Poverty and environmental degradation are closely associated and causally interlinked and should therefore be addressed together. The international goal of halving the number of people living in extreme poverty by 2015 and reversing environmental degradation will require addressing rural and urban poverty and environmental degradation simultaneously.

“Gender disparities in access to resources should be noted.”

Men and women use resources differently and have different roles in society. To be effective, strategies to decrease poverty and preserve the environment must therefore pay close attention to the impact of disparities between women and men on access to resources and opportunities. Moreover, there is much evidence that gender equality and empowerment of women has positive effects on a variety of other important aspects of development – notably population growth and health.

“Gender equality is a development objective of its own right.”

At the same time, addressing gender disparities should not be reduced to a means of ensuring the effectiveness of poverty reduction strategies. Gender equality is a development objective in its own right, and sustainable development strategies must aim to foster women’s empowerment and effective participation. This implies involving women and men as partners and allies in formulating and pursuing strategies for more equal societies.

“Poverty-environmental linkages take different forms in rural and urban contexts.”

Poverty-environment linkages take different forms in rural and urban contexts. In rural areas, critical issues relate to access to natural resources such as land, forests, or fisheries and their sustainable use. In urban zones, the poverty-environment agenda centres on questions relating to the use of natural resources such as water or air as sinks for the disposal of human and industrial wastes, and their impact on the poor. For the sake of analytical clarity, this paper attempts to outline the main linkages between poverty and sustainable development by distinguishing between rural and urban contexts, in order to focus on the unique features of each.

“Urban and rural environments cannot be considered in isolation from each other.”

This distinction has limitations insofar as urban and rural environments cannot be considered in isolation from each other. For example, urban-based activities provide the rural poor with income diversification opportunities that can be critical in times of adverse climatic conditions. Regular seasonal migration to seek work in urban centres is also a common feature of the livelihood strategies of rural families. Conversely, urban-based activities often have negative impacts on neighbouring environments by transferring pollution or waste, converting surrounding agricultural land to urban

uses, and overexploiting neighbouring forests through the collection of fuelwood. Urban and rural economies are strongly interdependent in many other ways. The rural and urban poor both have limited access to basic social services such as health, sanitation, and education. To avoid repetition and duplication, questions relating to the access to social services are covered in this paper in relation to the urban environment. This is not to suggest that the urban poor have less access to basic social services than their rural counterparts. The reverse is usually the case.

This paper attempts to provide an overview of the key linkages between poverty and environment in rural and urban contexts, as well as on the policy implications at the micro, meso and macro-levels. Throughout the text, the gender dimension is addressed wherever it has a specific relevance. More general analysis of the challenges underlying poverty reduction and sustainable development strategies and corresponding recommendations for donors are provided in: *DAC Guidelines on Poverty Reduction: Strategies for Sustainable Development: Guidance for Development Co-operation* (OECD, 2001). The *DAC Guidelines on Gender Equality and Women's Empowerment in Development Co-operation* provide further information on gender dimension in the development co-operation context.

“Poverty is multi-dimensional.”

Box 1. Who are the poor?

Until the 1970s, poverty was usually understood in terms of falling below certain minimum levels of food intake, income or consumption. This narrow approach is no longer widely accepted, either by social scientists or by development agencies and practitioners. Progressively more significance has been given to the ways poor people themselves view their situation, and how poverty is conceived in different cultures. Today, a poor person is one who is unable to meet the minimum conditions of well-being, as these are understood in societies around the world. Typically, this involves a range of inadequacies in consumption, several forms of insecurity and an inability to participate in what are considered minimal ways in social life.

According to a recent view from the World Bank “Poverty is multi-dimensional, extending from low levels of health and lack of education, to other ‘non-material’ dimensions of well-being, including gender gaps, insecurity, powerlessness and social exclusion”. For the United Nations Development Programme (UNDP), human development is defined as “the process of enlarging human choices”. Human poverty means therefore “that opportunities and choices most basic to human development are denied – to lead a long, healthy, creative life and to enjoy a decent standard of living, freedom, dignity, self-respect and the respect of others”.

Given the multi-dimensional nature of poverty, the precise measurement of who is poor cannot only be restricted to measurement of income-based poverty, but must also define social categories such as gender, ethnicity, location, livelihood status, etc. A distinction can also be drawn between people in chronic (long-term) poverty and those suffering transitory poverty. The latter may be as a result of natural or macro-economic shocks.

Households in chronic poverty can also be disaggregated according to their specific characteristics and causal factors. One category of the chronically poor may experience poverty in several dimensions, for example socially excluded groups, people with disabilities, refugees and displaced persons, people suffering from HIV/AIDs etc. Another category are those who suffer chronic poverty primarily as a result of inadequate access to productive assets.

This variation in the dimensions and characteristics of poverty highlights the need for careful analyses using different sources (including participatory poverty assessments) to support the development of appropriate interventions. Also, different manifestations of poverty have different implications for the environment.

The table below attempts to characterise poor households by rural/urban location and by the chronic or transitory nature of poverty. These categories are illustrative rather than giving a complete picture. Also, given the dynamic nature of poverty processes, there can be movement between the categories, e.g. a poor smallholder in one year may next year be part of the urban informal poor; a transitory poor formal sector worker may slide into chronic poverty through suffering long-term unemployment.

Poverty “type”	Rural poor	Urban poor
Transitory	Viable farmers, pastoralists and landless rural workers affected by sudden natural shocks or seasonal income losses; rural households affected by civil conflict	Urban formal workers (and dependents) suffering temporary unemployment or real wage declines
Chronic, asset-poor	Smallholders, small herders or landless with limited/no access to productive assets, and/or deteriorating asset base; rural communities isolated from markets and services; labour-poor households	Urban informal sector with limited/no access to productive assets; labour-poor households, especially-female-headed households
Chronic, multi-dimensional	Marginalised cultural categories (ethnic or caste groups, marginalised indigenous communities); households with high dependency ratios; chronically sick and disabled	Marginalised cultural categories; households dependent on anti-social activities; refugees, internally displaced persons, undocumented aliens.

I. POVERTY-ENVIRONMENT-GENDER LINKAGES: THE RURAL CONTEXT

A. Introduction

“Resource degradation is an acute problem in rural areas.”

Over half of the world’s poor live in rural areas. Although urban poverty is rising, the correlation between poverty and remoteness from urban centres is strong in most countries and is expected to remain so in the foreseeable future. As compared with their urban counterparts, rural people are often isolated from economic opportunities and have less access to basic social services. Resource degradation is an acute problem in rural areas, with some 60% of the world’s poorest people living in ecologically vulnerable areas (Angelsen, 1997). The situation is worst in Africa, with two thirds of the continent being deserts or drylands. Africa also has extensive agricultural drylands, almost three quarters of which are already degraded (UNCCD, *no date given*). In many developing countries, declining rates of yield growth and accelerating resource degradation contribute greatly to conflict over natural resources. Food insecurity and malnutrition are critical concerns.

“Increased farm output alone may not resolve poverty and resource pressures.”

Increasing farm productivity is generally a precondition to improving food security and income in rural areas. This can also relieve pressures to expand farming and grazing into ecologically fragile areas and reduce reliance on unsustainable resource extraction activities. Efforts to raise agricultural production – by improving crop yields, technology, and access to inputs and markets and fostering a shift towards higher value crops – are thus often seen as a means of simultaneously addressing growth, equity and environmental issues in rural areas.

Nevertheless, criticisms levelled against such practices, particularly in the context of the ‘Green Revolution’, have to be borne in mind: these include the promotion of monocultures and the loss of genetic diversity; as well as increased dependence on factors that may be ecologically harmful and unaffordable for poor farmers (e.g. fertilisers). Where the correlation between poverty and landlessness is strong, the benefits of improved productivity are often skewed towards land-owning farmers. The equity impacts of increased productivity and incomes are thus often ambiguous. It cannot, therefore, be assumed that increased farm output alone will create sufficient income opportunities for the rural poor and reduce pressure on land. Furthermore, the scope for increasing agricultural yields is limited in many areas. All this calls for alternative approaches to the raising of rural incomes.

“Poor rural families rely on many sources of income.”

Even for land-owning households, farming alone often cannot provide sufficient means of survival, notably where rising population leads to reduced farm size. Poor rural families generally rely on a wide variety of on and off-farm activities and income sources. Many of these are based on natural resources. They include activities such as gathering firewood, preparing charcoal, fishing, hunting, handicrafts, and gathering non-timber forest products such as medicinal plants, fruits, and rubber, etc. [see Box 2]. Many landless poor also work as farm labourers. Survival and livelihood diversification strategies also include various types of migration. For example, some members of a household –

generally men – may live semi-permanently in urban areas while others – generally women – usually stay in rural areas.

Box 2. The diversity of rural incomes

In sub-Saharan Africa, a 30–50% range of reliance on non-farm income sources is common; in southern Africa, however, it may escalate to 80–90%. In South Asia, on average, roughly 60% of rural household income comes from non-farm sources. However, this proportion varies widely between, for example, landless households and those with access to land for farming.

Source: Ellis (1999).

“Addressing rural poverty and environmental degradation requires cross-sectoral approaches.”

Addressing rural poverty and environmental degradation therefore often requires broad cross-sectoral approaches, which must go beyond agriculture. These efforts must focus on the diversity of livelihood sources and address systemic conditions that constrain the ability of rural poor to overcome poverty. For example, efforts to increase access to health, education and other basic social services, as well as transport and communication, directly affect the ability of rural poor women and men to pursue alternative incomes on and off the farm. Poor literacy and numeracy make it more difficult for rural poor to obtain information about ways to use resources sustainably and productively. It also limits their ability to develop livelihoods that do not depend on natural resources, or to obtain wage-earning jobs. Thus, improved access to education is critical to lower rural poverty and decrease the dependence of rural poor on natural resources for their livelihood. In many countries girl children are less likely to go to school, and more likely to drop out early, because of economic and cultural pressures. This differentially affects their livelihood opportunities as they become adults. Similarly, access to effective reproductive health services is also needed to provide people with an ability to manage the size of their family. Issues related to health and education, although crucial, are not addressed in detail here, as the focus is on direct environment-poverty linkages. Nonetheless, there is a positive linkage between increased incomes and increased access to health and education, which in turn is likely to have positive impacts on livelihood diversification.

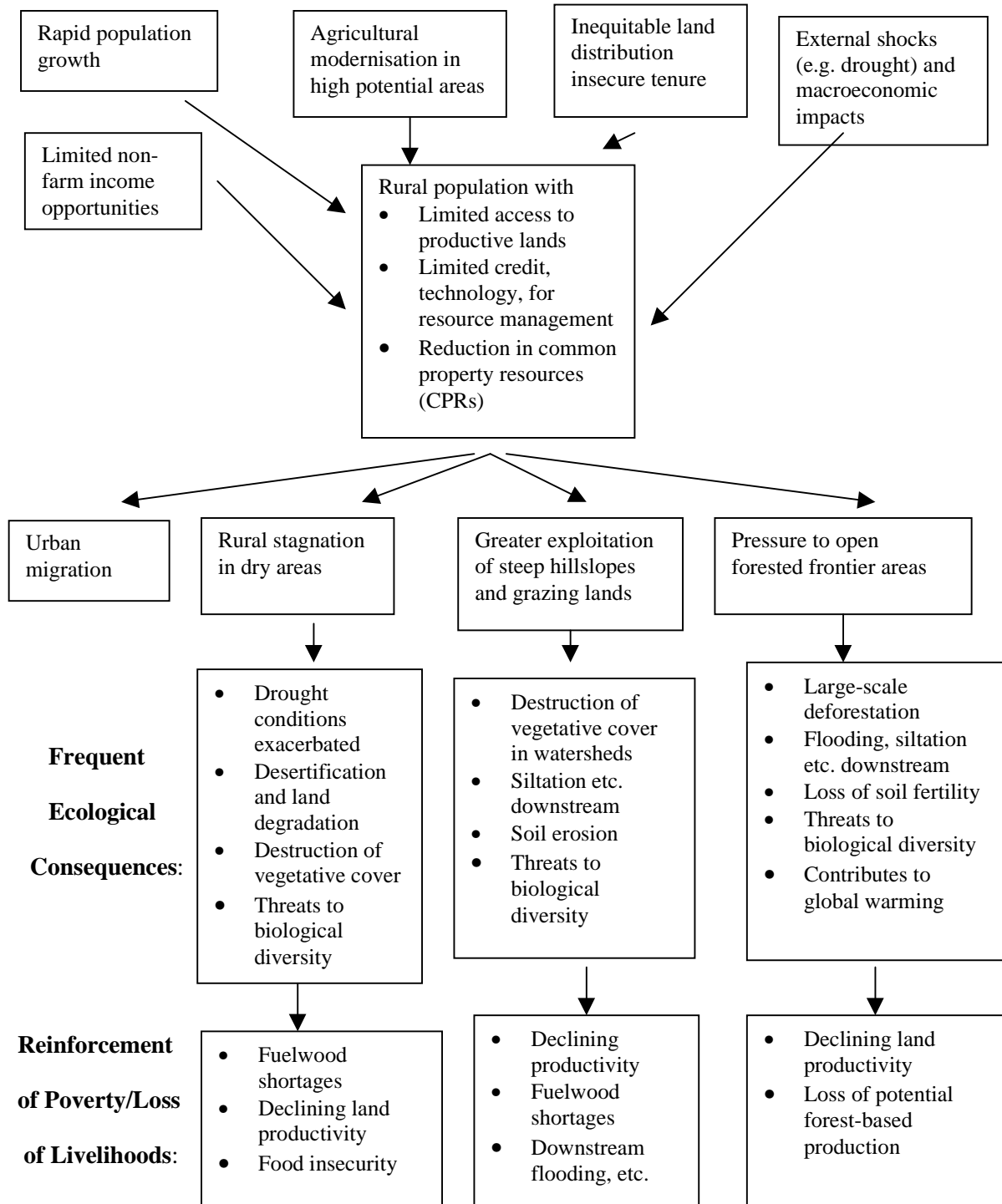
“The sustainable livelihoods approach places people at the centre of development.”

Box 3. Sustainable livelihoods

Livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood can be said to be sustainable when it can cope with and recover from stress and shocks, and maintain or enhance its capabilities and assets, without undermining the underlying natural resource base. By placing people at the centre of development, a "livelihoods" approach stresses the importance of influencing policies and institutional arrangements so they support the needs of the poor. For example, achieving conservation objectives in an area has often meant restriction or prohibition of traditional activities of importance for the poor. This raises two problems: Firstly, it is clear that the poor may be harmed when management demands less use in the short-term in return for a better resource later without access to alternative resources in the meantime. Secondly, such a policy may even be pointless from an environmental perspective – for instance, if access to fuelwood from one area is restricted but no alternative provided to the poor, then this may simply shift the resource strain on neighbouring forests. Thus, the concept of “environmental entitlements” addresses the important issue of the extent to which households, especially those highly dependent on natural resources for their livelihoods, actually have adequate access to those resources. The sustainable livelihoods approach stresses participation by the poor in order to identify the key constraints they face and to seek the most promising alternatives.

Some of the key poverty-environment interactions in rural areas are shown in Figure 1.

Figure 1. Poverty-Environment Links (rural areas)



These interactions are discussed further in section I.B below. Factors such as rapid population growth, inequitable access to productive assets, especially land, the neglect of agriculture outside high potential areas, and the impact of external shocks, combine in certain areas to produce and reproduce poverty. Limited alternative non-farm income opportunities reinforce this situation. Poor households tend to respond either by migrating or by other options such as an expansion of farming activity to open new lands to cultivation, which may increase the pressure on natural resources. Such pressures have damaging ecological consequences which further reinforce the initial poverty/loss of livelihoods. There are therefore negative feedback mechanisms perpetuating both poverty and environmental degradation. Where a household responds by migrating, it is usually male members who migrate, thereby leaving women in charge of all household activities. The limited labour power available to women in this situation may render them unable to sustainably manage land, thereby adding to land degradation, although such an outcome is not inevitable.

“Poverty-environment processes involve many actors, not just the poor. There are many examples of positive interactions between poor people and the environment.”

The interactions shown in Figure 1 are illustrative of certain poverty-environment processes where poor households are “compelled” to degrade environmental resources. However, this should not obscure the fact that much environmental degradation is caused by large-scale commercial operators, and by State policy; and there are many examples of positive actions by poor households and communities to manage environmental resources sustainably (see for example Box 19 on community-based resource management).

Where environmental degradation is caused by commercial operators and/or State policy, poor households still suffer. They may be pushed into more marginal areas by large-scale logging or ranching activities, or may face lower productivity on crop and grazing land downstream of logging operations. State policy may be another mechanism compelling poor households to degrade their environment, for example if land or tree tenure rights are insecure. These pressures are discussed further in sections I.B below.

“Development interventions needs to be increasingly aimed at identifying and strengthening the positive interactions between the poor and the environment.”

In terms of the positive interactions between the poor and environmental resources, development interventions need to be increasingly aimed at identifying these interactions (existing or potential), strengthening them, and replicating/scaling-up successful approaches. Some of these areas of intervention are discussed in sections I.B and III of this document.

B. Key interactions between poverty, the environment and gender: the rural context

1. Pressures on common property resources (CPRs)

“The poor are highly dependent on common property resources (CPRs).”

Poor households are often highly dependent on “common property resources” (CPRs) which include fallow fields, forests, fishing grounds, pastureland and wetlands for their livelihoods. CPRs are a source of a variety of goods including food, fodder, fuel, medicinal plants, which are important sources of sustenance or income for many land-less poor (See Box 4). For many rural poor women and men, CPRs are their main source of food, fuel, building materials, and income. For others, they are a

critical source of supplementary income or food in times of crises such as drought, in periods when employment opportunities are scarce, or when food stocks are low before the harvest.

Heavy reliance on CPRs thus makes poor women particularly vulnerable to their degradation, depletion, appropriation and/or conversion to other uses. Women, who often are not allowed to own land, make particular use of the resources found in CPRs for household purposes. Depletion of these resources means that women will need to walk further to collect water and fire wood, etc. Women and men tend to use different aspects of CPRs. Where women do not have the voice to directly influence decisions affecting the uses of CPRs, their exclusion from decision-making can result in resource uses which negatively affect them.

“CPRs provide many critical environmental resources.”

In addition to their role as a source of livelihood for many rural poor, many CPRs provide a wide range of critical environmental services and are important habitats for a wide variety of animals and plants. These services include maintaining hydrological balance, stabilising soil, serving as breeding grounds for fish, purifying water, etc. The viability and productivity of a large number of economic sectors (agriculture, fisheries, water supply, etc.) depend indirectly on these services. CPRs thus perform critical social and environmental functions.

Box 4. Common property resources (CPRs)

CPRs include uncultivable or fallow fields, pasturelands, forests, inland waterways, ponds, and low-lying wetlands. They represent a significant component of the land resource base and have special importance for the poor¹. The range of products drawn from CPRs for subsistence needs or for sale is wide and varied. It includes food, firewood, small timber, manure, fruits, medicinal herbs, roots, leaves, bark, fibres, seeds, nuts, gum, spices, resin, sap, syrup, oils, materials for house construction, handicrafts, etc. Hunting and trapping of mammals, aquatic species and birds often represent important food sources. Fodder and water for livestock are often drawn primarily from CPRs.

Wetlands provide a special case in point. They are used by fisherfolk, hunters, charcoal makers, pastoralists and agriculturalists under traditional resource sharing regimes at different seasons, and also harbour a wide variety of fauna and flora. Ensuring compatibility among such a wide set of users poses special challenges. Conventional access rights are particularly hard to define, since water levels are not the same each year and patterns of flooding are erratic. Even the most elaborate traditional arrangements seldom extend to upstream water users, often leading to over-extraction or pollution by industrial or agricultural users. This has severe consequences on downstream fisheries resources.

“Traditional resource-sharing systems can prevent degradation of CPRs.”

Access to CPRs is generally governed by traditional rules that determine who can use different aspects of the resource, and when. For example, farmers may grow maize on a flood plain and cattle owners may have the right to graze cattle in the fallow fields after harvest – a mutually beneficial arrangement which contributes to fertilising the land and providing cattle forage. In addition to guaranteeing continued access to the most vulnerable members of the community, traditional resource-sharing systems can play a critical role in avoiding overexploitation and degradation of

¹ In some cases, it is the relatively better off who can devote the most time to gathering produce from CPRs and are thus the heaviest users. As a general rule, however, it is the poorest who derive the greater share of their overall needs from CPRs.

collective resources and ensuring compatibility among various uses. In many countries, however, intensified competition amongst users and the erosion of traditional arrangements are reducing the quality and availability of CPRs with severe social and environmental implications. Thus, CPRs often become de facto “open access resources”.

2. *Pressure to use open access resources and marginal land*

“Resources which become open access are often rapidly depleted.”

Unlike CPRs, “open access resources” are not controlled by any user and are thus open to all. In many countries, although the state is the formal owner of resources, such as forests or wetlands, the responsible authorities have been unable or unwilling to enforce this ownership². Thus the resources have often become de facto open access. This has led to rapid exploitation and depletion, as users maximise their short-term gain from the insecure and often illegal access to the resource. Private concessionaires with close links to the state are often responsible for this rapid exploitation.

“Expansion of agriculture to open access forests leads to serious land degradation.”

The expansion of agriculture to open access forest lands is a major environmental consequence of poverty, food insecurity, and landlessness in many countries, notably in the tropics. Although nominally managed by the state, forests made accessible by the construction of roads become de facto “open access” in the wake of logging operations by private concessionaires, who often fail to comply with their obligations to manage the forest sustainably after harvest. Where there is a shortage of alternative income opportunities off-farm, landless peasants resort to converting these de facto open-access lands to subsistence agriculture.

The combination of fragile, often steeply sloped terrain, low fertility, crops unsuited to the terrain, lack of external inputs, and “slash-and-burn” farming techniques results in serious and rapid soil exhaustion, erosion and sedimentation³ [see Annex 1]. In these cases, cleared land has to be abandoned after only a few cropping seasons, triggering a need for further forest land conversion farther out on the agricultural frontier. The impacts of such “informal agricultural expansion” on downstream infrastructure, including roads, irrigation, water supply, and hydroelectric facilities often far exceed the value of the crops produced. The uncontrolled expansion of agriculture on marginal land is also a major cause of biodiversity loss, including on officially protected natural reserves.

² In some cases, state ownership is only formal, and the resources are actually managed by communities as CPRs. Where traditional access regimes are effective, the resources are protected from encroachment and mismanagement.

³ Excessive forest exploitation for timber or fuel wood has similar impacts.

Box 5. Deforestation and land degradation

Research on land clearing throughout the tropics has shown that deforestation leads directly to degradation of soil structure and changes the chemical and biological properties of the soil, decreases the porosity of the surface layer, increases soil compaction, and decreases the infiltration rate.

The soil-erosion impacts of forest conversion depend on what the forest is converted into. For example, if a forest is converted into a tree plantation it is less likely to lead to erosion than if it is converted into annual mono-crop agriculture. The type and composition of trees or crops and the management approaches will also influence the level of soil degradation, i.e. multi-storied tree gardens and land allowed to fallow will normally degrade less than clean weeded tree crops and annual cropping without fallow.

Deforestation is nonetheless a major source of human-induced soil degradation in developing regions. While it occurs on all continents, it is most pronounced in Asia, where it has caused the degradation of 298 million hectares. Africa has the highest rate of degradation caused by overexploitation of fuelwood (13%) (World Resources Institute 1992).

Other examples of open access resources threatened by over exploitation include near-shore fisheries, coral reefs, pastoral lands, and wetlands (i.e. mangrove areas are over-harvested for tannins, poles and wood for charcoal production, often by landless people).

“Fishery resources are threatened by overfishing.”

Coastal, lake and sea fisheries are another resource under severe threat. Unsustainable harvesting practices (e.g. dynamiting of coral reefs) are one major cause of this degradation, but more generally lake and sea fisheries are exposed to overfishing due to substantial increases in fishing efforts, in some cases (e.g. on Lake Victoria) following an export boom due to increased demand in world markets. The decline of fisheries has a direct impact on those involved in local fish processing and trading, activities dominated by women in many countries. Offshore fisheries may be exploited under bilateral agreements between the coastal State and other countries, but such agreements do not always provide a strong basis for sustainable use.

“Water resources often become open access.”

Box 6. Water as an “open access” resource

Water resources could in principle be managed by several users as common property resources. In the absence of effective mechanisms for co-management at the watershed or river-basin level, however, water resources often become open access. Conflicts often arise between upstream and downstream users. Irrigators at the tail end of a large irrigation system may have the formal right to water, but their share may be taken by farmers near the head of the system, who may even have switched to higher value and more water consumptive crops through collusion with irrigation officials.

Access to finance and technology, e.g. the ability to pump water from aquifers or dig deep wells, also determines who can access water resources. Thus powerful commercial farmers can effectively appropriate limited water resources for their own use, to the detriment of the poor. Water and fisheries resources can also be degraded by pollution from upstream industry or agriculture.

Inter-ethnic or inter-state competition over water resources is often a major factor behind violent conflict. This can occur in territories either where water resources cross borders, or where seasonal water availability causes social groups to move across borders in search of water (e.g. in pastoral areas).

3. *Natural disasters in rural areas*

“Natural disasters hurt the poor most.”

Droughts can result in heavy crop and livestock losses, in which the poor are usually disproportionately hurt. Poor livestock owners tend to engage in distress sales of livestock at depressed prices, leaving them extremely vulnerable to drought and other shocks in future, and possibly trapping them permanently in chronic poverty. Recurrent droughts in Sub-Saharan Africa over the last two decades have had devastating effects on natural resources and on livelihoods. Hurricanes in certain coastal zones can cause major declines in agricultural output as well as destruction of important infrastructure. Rural households which are most dependent on agriculture lose the most, particularly the poorest. Earthquakes can cause particular damage to irrigated and hilly areas as a result of damage to terraces and irrigation systems. Dams are liable to burst during earthquakes unless built to very high standards. In areas with rainfed agriculture, direct effects on production might be slight.

The most obvious countermeasures against this are means of physically protecting human lives and livelihoods – e.g. shelters or dikes. In some rural areas of the developing world prone to natural disasters, these have contributed to a dramatic reduction of the loss of lives in cases of catastrophes in recent years (Bangladesh is a case in point). Moreover, low-cost initiatives which provide some element of “proofing” against natural disasters can lessen the impact of such events on the poor. In hurricane-prone areas, such initiatives might focus, for example, on environmental conservation and reforestation. In places prone to droughts and floods, actions could include the creation of community food banks, availability of credit, and development of innovative forms of insurance.

There also is substantial national and agency experience in the development of early warning systems to reduce the impact of droughts, but such systems have not always been effective or sufficient to prevent major human and economic losses. Early warning systems and preparedness measures have been developed in Bangladesh to mitigate the impacts of cyclones with some success. Key to this is mobilisation of local communities to ensure a rapid response to warnings.

C. **Main sources of pressure on rural poor’s livelihoods**

1. *Demographic pressure and unequal land distribution*

“Increases in population density in rural areas affect the environment in many ways, e.g. expansion of agriculture to marginal and pasture lands.”

Increases in population density in rural areas can affect the environment in a number of ways: as individual farm sizes decrease (a finite amount of land is divided among a growing number of users), farmers often respond by shortening fallow periods to try to maintain production levels. Increased exploitation of open access and common property resources is another way of compensating for lower income from smaller farms. This may involve expansion onto more marginal land, such as hillslopes, resulting in further soil degradation. Pasturelands and fishing grounds become exploited more intensively, often to unsustainable levels. Pasturelands may be converted to use for crop production, thereby intensifying grazing pressures on the reduced pasture area. In addition to impairing their productivity, increased competition over resources often leads to conflicts among users. As a consequence, the land available for the growing number of rural poor to use tends to be marginal land. Inequitable land distribution and a shortage of alternative income opportunities

exacerbate these pressures. Conversely, more equal land distribution and the existence of alternative non-farm income opportunities help to reduce population pressure on resources.

In order to address and affect these dynamics in the long term, the processes that underlie the specific demographic, poverty and environmental linkages must be addressed. For example, abating high rural fertility entails an understanding of the economic and sociocultural functions of large family sizes in rural societies.⁴ Improved female education, and advances in legal and cultural systems that support women's ability to make independent choices in the productive and reproductive spheres, can have an important influence on family size.

“Rapid population growth may not always result in environmental degradation. Innovations for sustainable resources management should be induced/supported by policy.”

Rapid population growth by itself may not always result in environmental degradation. There is case study evidence that some farm households and communities develop technical and institutional innovations in natural resource management in response to increasing pressures on resources. Such responses do not happen in all areas however, and need to be induced and supported through policy measures and other development interventions (for example in the areas of tenure, reorientation of agricultural research and extension, etc.). Fragile environments faced with heavy population pressure are priority areas for such interventions.

Environmental degradation may contribute to further population growth, by increasing demand for family labour-power (for example because of the need to move further from the home to graze cattle, collect water and fuelwood, etc.). Conversely, an improvement in environmental management which reduces degradation might be translated into a reduced demand for workers and therefore lower fertility.

Box 7. Examples of the links between Population, Poverty and the Environment

“Poverty” affects “Population” through:

- Limited access to water supply, fuel and labour-saving devices increases the need for children to help in fields and homes.
- Low asset base increases the need for children as insurance against illness and old age.
- Low level of education means less awareness of family planning methods, particularly for women.
- Low status of women means that they have limited power to control fertility.

"Population" affects "Poverty" through:

- Increasing landlessness - inherited plots divided and subdivided among many children.
- Overstretching available social services, schools, health centres family planning clinics, water and sanitation services.

"Population" affects "Environment" through:

- Increasing pressure on marginal lands, over-exploitation of soils and forests, overgrazing.
- Soil erosion, silting, flooding.
- Migration to overcrowded slums, problems of water supply and sanitation, industrial waste dangers, indoor air pollution, mud slides.

Source: Alain Marcoux; FAO (1999).

⁴ Economic factors may be critical in decisions concerning family size, but there are also cultural and other factors – early age of marriage, lack of acceptance of means of family planning, etc. – which tend to promote large families, and which need to be understood and addressed.

2. ***Reduced quality and availability of common property resources***

A number of policies and other factors directly affect both the quality and availability of resources that the poor rely on.

a) Official land use policies⁵

“Government-sponsored schemes to alter land use may negatively impact on poor land users.”

Government-sponsored schemes, such as the conversion of wetlands to irrigated agriculture or aqua-culture, the conversion of tropical forests to large-scale plantations or cattle ranching, or the awarding of logging concessions to timber companies, have a direct impact on the livelihoods of the people using these resources⁶. Government authorities sometimes fail to see that the so-called "waste land" or idle land being converted or awarded for private use is actually an essential resource for many people and provides critical environmental services.

“Tenure legislation often ignores traditional claims and systems of indigenous communities.”

Tenure legislation also is often blind or hostile to the traditional claims of indigenous communities and disregards their natural resource management systems and rights. Policies fostering the colonisation of indigenous areas – sometimes to divert pressure for land reform effectively encourage colonists to treat land occupied by indigenous communities as “open-access”.⁷

State policies have also had a significant impact on the property regimes governing large-scale grazing lands, and consequently on pastoralists’ livelihoods. Many countries’ state policies and land legislation have supported the conversion of grazing land operated under CPR regimes to privatised and generally large-scale ranches. In part this has been due to the mistaken diagnosis of common grazing lands as being inevitably subject to a “tragedy of the commons”.

“Privatisation of grazing lands has marginalised poorer herders.”

Privatisation of grazing lands has often resulted in marginalisation of poorer herders and their families, making them more vulnerable to drought, and contributing to desertification. Pastoralists are among some of the most vulnerable categories of people who are regularly discriminated against, implicitly or explicitly, in State policy. However other factors such as population pressure and the expansion of crop production also contribute to their marginalisation (Little, 1987).

⁵ This category can be termed “institutional failure”, i.e. state policies which directly or indirectly contribute to increased poverty and environmental degradation. However, there are also examples of “market failure”, where price signals also promote poverty and degradation, as in the cases of a wide range of externalities and of biodiversity losses.

⁶ There may, however, be tradeoffs, as in-kind income from CPRs can be replaced by wage labour income.

⁷ Tenure legislation in several countries classifies un-privatised forest land as “idle” and therefore subject to appropriation by colonists, and ineligible for tenure rights until cleared.

Box 8. Political economy of poverty

From a “political economy” perspective, the analysis of poverty focuses on the competition between different social groups for economic and political power. Poverty can thus be viewed as a historically determined relationship among social groups, who have highly different ability to gain control of life-supporting assets, be they productive, environmental, or cultural.

In this view, poverty cannot be reduced to a state of existence that could eventually be overcome with economic growth. Rather, it is the result of social, economic, and political processes that lead to the concentration of power, wealth, and access to productive assets (including environmental resources) and other prerequisites for social well-being in the hands of the same social groups. In the southern Africa region, for example, historically determined unequal land distribution patterns have contributed to unsustainable population pressure and land degradation in communal farming areas.

This has important policy and operational implications. According to a political economy perspective, addressing poverty requires not only economic growth but also changing the social relations at the root of poverty – namely altering the means and processes by which groups gain and hold control over productive assets.

A “political economy” analysis of poverty would focus on the following factors:

- Local-level factors: access to land and other means of production, environmental assets, and influence over local political and judicial systems.
- National-level factors: fiscal regimes, budgetary allocation systems, regulatory regimes, and public credit programs.
- International level factors: international goods and financial markets and trade regimes.

b) De-facto privatisation by individuals

“Privatisation of CPRs by better-off community members marginalises poor users.”

Privatisation of CPRs can also happen indirectly, when powerful community members refuse to honour traditional arrangements that govern access to CPRs. The emergence of new market opportunities, due to new technologies, crops, or outlets, can increase the incentives for relatively powerful community members to claim common access resources for their exclusive use. For example, increasing urban demands for food and fuel or improved access to markets due to road infrastructure may make it possible and profitable to expand production into CPRs. In some instances donor-supported programmes which raise the productivity of CPRs, for example fisheries restocking programmes, have indirectly contributed to this expansion by wealthier groups. Often the poor are not able to enforce their rights and resist such privatisation. As a result, common resources are often enclosed by the more powerful for their own use, a process which has been observed historically in many parts of the world.

Converting CPRs to intensive farming, livestock grazing, fuel wood production, or other activities by better-off farmers directly impacts the livelihood of the poor, and increases pressures on remaining common resources.⁸ The resulting environmental impact can be severe. For example, in many parts of Asia and Latin America, mangroves have been converted to commercial aqua-culture,

⁸ Privatisation of common property land for cultivation appears to be quite substantial in India. This has led to a notable increase in firewood collection time – borne almost entirely by women – decreased access to fodder, and a subsequent increase in market purchases.

devastating large areas critical as fish breeding grounds, erosion-control buffers, natural silt traps, and water purifiers. In many of these areas, fish catches of the poor have declined as reefs have become smothered by silt and there is less breeding area for fish.

“Conversion of mangroves to shrimp farming is often financially and ecologically unsustainable.”

Box 9. Conversion of mangroves to shrimp ponds

Mangroves in many countries of Asia and Latin America have been converted on a large scale into commercial areas for aqua-culture used for shrimp production, partly to serve rapidly expanding foreign markets. These shrimp ponds have often proved to be financially and ecologically unsustainable. Without proper measures to protect and irrigate the areas, the shrimp pond may last only two to four years. As shrimp feed, excrement, antibiotics, fertiliser, an explosion of plankton, harmful bacteria and viruses, influent and effluent from different farms become mixed, the ponds end up choking on their own wastes. The degradation of the ponds forces people to abandon them and convert other intact mangrove areas.

Shrimp farming can be socially, ecologically and financially sustainable, in the right place, with the right infrastructure, and the right management (i.e. enhancement of existing shrimp ponds rather than conversion of mangroves). Sustainable shrimp farming can generate far more income and employment than many alternative uses, or the sum of compatible alternative uses. This can be beneficial for the poor if they have access to the ponds. However, in some countries (e.g. Bangladesh), shrimp production has been developed by outsiders who displace local farmers and land uses, thereby intensifying both poverty and ecological degradation.

- c) Gradual breakdown of traditional CPR management regimes

“Traditional CPR management systems may break down.”

Traditional systems to manage CPRs are built on common beliefs within the community. As these beliefs change, traditional CPR management systems become less effective. In many countries, community beliefs are changing rapidly in response to a variety of pressures, such as changing land use practices, population growth, individualisation, the introduction of market values, and the erosion of the power of traditional authorities.⁹ When market orientation increases, natural resources such as trees or fish, traditionally used more for domestic consumption, become commodities for sale, usually by men. Donor programmes promoting such market orientation can have unforeseen gender consequences. Increased access to information, as well as the increased incidence of immigration and emigration can also erode traditional social values. Long-standing and sophisticated traditional systems of community resource management thus often break down, without being replaced by equally effective modern institutions. As customary management systems and agreements break down, many traditionally managed CPRs are converted to either exclusive or open access use.

- d) Mismanagement of water resources

Poor water management, combined with high population density compared to available water supplies, results in water shortages in many places. Shortages often have an impact on the poor first and foremost, as they may have intermittent irrigation water and be unable to grow crops reliably. The poor often have to spend many hours collecting water for domestic use, which can significantly limit their ability to generate income. This is a problem for women (and girl children) in particular, who are generally given the task. It can further limit the ability of female-headed households to

⁹ Communal tenure arrangements often conceal the power relations which underlie land use and allocation.

cultivate land, since the women need to divide their limited time between collecting water and farming. (Issues relating to access to drinking water are in many respects similar in rural and urban environments, and are addressed in more detail in the section on urban environment below).

e) Resource degradation from pollution

Pollution from industry or urban centres is an important indirect cause of degradation of water bodies and lands. This increases the risk of exposure to toxic chemicals and disease pathogens either directly or through consumption of contaminated fish and shellfish. Women suffer the greatest exposure risk from polluted water because they contact water more than men do. Pollution also lowers the productivity of freshwater and coastal ecosystems, which directly affects the income and livelihoods of poor men and women using these resources.

“There are specific poverty-environment interactions in different ecosystems.”

The key poverty-environment interactions and key pressures on poor people’s livelihoods are to some extent applicable across ecosystems. However, there are also specific interactions and pressures in particular ecosystems, depending primarily on the biophysical nature of the system and on the human uses of and pressures on the system. Table 1 summarises, by ecosystem, some of these pressures, key environmental impacts, and appropriate win-win policy responses. There are other ways of categorising land-environment-human interactions, for example in terms of assessments of land suitability (favoured lands, marginal lands, etc.), but an ecosystem classification points out the diversity both of ecological systems and of livelihoods which are strongly based on critical functions and services supplied by those ecosystems.

Policy responses similarly have to be diverse and appropriate to specific human needs, especially of the poor, as well as to ecological needs. Where there is a vicious cycle in operation between poverty and environmental degradation – which can involve complex processes rather than a linear relationship – policies must aim at reversing the nature of the relationship. However there also has to be a recognition of potential trade-offs and the need to address conflicts between competing resource users, both of whom might be poor.

Table 1. Poverty-Environment Pressures on Specific Ecosystems

Ecosystem	Socio-economic pressures	Environmental impacts	Policy responses
Irrigated lands: provide <ul style="list-style-type: none"> • Employment in rural areas • Food, fibre crops, crop genetic resources • Habitats, soil organisms • Sequester atmospheric carbon 	<ul style="list-style-type: none"> • Rural poverty • Intensive agriculture (use of chemical inputs) • Subsidies 	Land degradation: <ul style="list-style-type: none"> • Soil erosion • Water pollution • Salinisation • Water-logging • Pesticide poisoning • Loss of biodiversity 	<ul style="list-style-type: none"> • Reduce input subsidies and promote Integrated Pest Management • Introduce economic water charges • Promote water users association for improved management • Promote bye-laws supporting polluter-pays principle

Poverty-Environment-Gender Linkages

Ecosystem	Socio-economic pressures	Environmental impacts	Policy responses
<p>Arid and semi-arid areas: Important for pastoralists and mixed farming, but:</p> <ul style="list-style-type: none"> • Drought-prone • Low soil fertility 	<ul style="list-style-type: none"> • Poverty and food insecurity • Unsustainable and low-productivity farming practices • Overgrazing • Conflicts between agriculturalists and pastoralists • High levels of seasonal out-migration especially by males 	<p>Land degradation:</p> <ul style="list-style-type: none"> • Soil erosion • Water run-off • Gullying • Loss of vegetative cover • Loss of biodiversity 	<ul style="list-style-type: none"> • Support development of sustainable farming practices through participatory research • Promote erosion control measures giving economic returns (e.g. agro-forestry) • Strengthen pastoralist groups and address tenure issues • Promote food security measures • Strengthen institutions to resolve conflicts
<p>Forests:</p> <ul style="list-style-type: none"> • Diverse and widespread • Serve complex environmental, economic and social functions • Sequester atmospheric carbon 	<ul style="list-style-type: none"> • Unsustainable timber extraction • Land-use pressures • Expansion of farming and ranching activities • Destruction of local livelihoods • Fires • Harmful air pollutants 	<ul style="list-style-type: none"> • Increased downstream erosion and flooding • Loss of carbon sequestration • Loss of biodiversity 	<ul style="list-style-type: none"> • Promote sustainable forest management and sustainable use • Support indigenous communities through holistic approaches • Eliminate subsidies supporting large-scale forest clearance • Support objectives of Convention on Biological Diversity in maintaining biodiversity and in benefit-sharing
<p>Marine ecosystems:</p> <ul style="list-style-type: none"> • Cover 70% of world's surface • High biodiversity especially near coastal zones 	<ul style="list-style-type: none"> • Overfishing • Conflict between commercial fishing and artisanal fisheries • Poverty of artisanal fishermen • Dumping toxic wastes 	<ul style="list-style-type: none"> • Collapse of fish stocks • Marine pollution 	<ul style="list-style-type: none"> • Strengthen policies to reduce fishing effort in critical areas • Support artisanal fisheries and small-scale processing and marketing • Strengthen policies against dumping wastes
<p>Coastal Zones:</p> <ul style="list-style-type: none"> • High biodiversity and fragility • Highly affected by human activity 	<ul style="list-style-type: none"> • Unsustainable fishing practices • Conflicts over resource use • Poverty of artisanal fishermen 	<ul style="list-style-type: none"> • Destruction of reefs • Decline in fish stocks • Sedimentation • Industrial pollution • Vulnerable to rising sea-levels • Vulnerable to natural disasters 	<ul style="list-style-type: none"> • Promote integrated coastal zone management • Promote sustainable fisheries management by local fishing groups • Support early warning systems and flood proofing measures in vulnerable areas • Promote polluter-pays principle to address upstream pollution

Ecosystem	Socio-economic pressures	Environmental impacts	Policy responses
<p>Wetlands:</p> <ul style="list-style-type: none"> • High biodiversity • Provide food security • Important ecological functions and habitats • Carbon sequestration 	<ul style="list-style-type: none"> • Expansion of agricultural activities • Expansion of unsustainable aquaculture practices • Waste dumping 	<ul style="list-style-type: none"> • Declining fisheries • Loss of biodiversity • Water pollution • Aquifer depletion • Soil drying and compaction • Loss of wildlife 	<ul style="list-style-type: none"> • Promote recognition of values of wetlands • Eliminate subsidies promoting drainage of wetlands • Support local conservation and management of fisheries • Support careful assessments of planned aquaculture developments • Support measures promoting economic returns from biodiversity, e.g. ecological tourism • Promote polluter-pays principle to address pollution
<p>Mountains and sub-mountain regions</p> <ul style="list-style-type: none"> • Fragile ecosystems • Variability in biodiversity • Increasing population pressures 	<ul style="list-style-type: none"> • Rural poverty (severe problems of access to water and basic services) • Abandonment of ecologically sustainable terraced agriculture • Agricultural extensification and reduced fallowing • Grazing pressures • Conflicts in resource use • Lack of clearly defined property rights • High levels of seasonal out-migration especially by males 	<ul style="list-style-type: none"> • Soil and gully erosion • Loss of biodiversity • Downstream sedimentation 	<ul style="list-style-type: none"> • Promote development of sustainable livelihood strategies for mountain populations • Support low-cost provision of basic needs with local participation • Support institutional development amongst mountain populations to address land use and resource conflict issues • Address property rights issues • Eliminate any subsidies promoting excess grazing pressure.

3. *The global dimension: desertification and biodiversity loss*

“Desertification and biodiversity loss are key ‘global’ poverty-environment concerns.”

In addition to the threats resulting from loss of common property resources, which are in some cases manifested at very local level, poor people’s livelihoods are fundamentally threatened by the global processes of desertification and biodiversity loss.

a) Desertification processes

“Desertification affects more than 900 million people in 100 countries.”

Desertification is the process of sustained deterioration of the biological productivity of land, as manifested in such phenomena as soil erosion, soil structure compaction, reduction in organic matter and nutrient content, and salinisation. Estimates of the extent of desertification vary, but some estimates suggest 70% of the world’s drylands (excluding extremely arid deserts), or 3.6 billion hectares, are degraded to some degree. The problem affects more than 900 million people in 100 countries, some of them among the least developed nations. Erosion, salinisation, compaction, and other forms of degradation affect 30 percent of the world’s irrigated lands, 40 percent of rainfed agricultural lands, and 70 percent of rangelands (Dixon et al., 1998).

“Desertification is linked to social, cultural, economic and political issues. There is negative feedback between poverty and desertification processes.”

While desertification was seen as a technical issue, it is now recognised to be inextricably linked to social, cultural, economic and political issues. The feedback between poverty and desertification creates a vicious cycle where deteriorating natural resources contribute to declining livelihoods, as people are forced to encroach further on fragile soils, sparse vegetation and limited water resources to meet basic needs. As with many processes of environmental deterioration, the poor are likely to be affected most, as wealthier groups assert their rights to limited resources.

“The Convention to Combat Desertification emphasises the need to engage affected communities and civil society organisations in measures to combat land degradation.”

The United Nations Convention to Combat Desertification is a response to the reality of severe land degradation and the consequent impacts on livelihoods. The Convention emphasises the socio-economic dimensions of desertification processes and the need to engage affected communities and civil society organisations in the formulation and effective implementation of measures to combat land degradation. Key areas of action include the establishment of early warning systems and mechanisms to assist environmentally displaced persons, drought contingency plans, the provision of food storage and marketing facilities in rural areas, the promotion of alternative livelihood projects to provide incomes in drought-prone areas and the development of sustainable irrigation programmes for crops and livestock.

In addition, there is a clear need to involve communities living in dryland areas in effective management of the natural resources there; this will include where feasible establishing or re-

establishing systems of common property resource management, and setting up mechanisms for disputes over access to and use of resources by different groups. Marginalised groups such as women and small herders must be adequately represented in any such management structures.

b) Biodiversity loss

“Biodiversity loss in dry areas is a critical issue for food supplies.”

Biodiversity loss is directly threatened by desertification, but is a much wider process observed in all major ecosystems. Biodiversity loss in areas experiencing desertification occurs as a result of the extensification process, whereby farmers attempt to compensate for declining productivity by converting more natural ecosystems to agricultural use, destroying habitats of animals and plants in the process. This is a critical issue for food supplies: almost all the globally important cereal grains originate from drylands, and the loss of the genetic forebears of these food plants could impair future ability to adapt their genome to accommodate a changing environment.

Biodiversity values vary significantly in type and amongst different stakeholders. Box 10 shows the different types of use and non-use values of biodiversity. Use values are of most immediate interest to poor households, in terms of supply of consumption items and income generated from marketable crops and animals; but the ecological services provided by biodiversity, and the risk-spreading effects of crop diversity, are also valued by poor households.

Box 10. Biodiversity Values

Direct use

- Commercial goods – natural ecosystem products, agricultural products, non-consumptive use.
- Subsistence and barter goods – food, fuelwood, building materials, medicines.

Indirect use

- Ecological services – soil retention, water filtration, air cleaning, carbon sink.

Option values

- Risk reduction through crop diversification
- Potential value as a resource that might yet be unknown

Socio-cultural values

- Self-sufficiency/autonomy for people
- Integral part of cultural identity and common heritage; symbolic/aesthetic; religious

Intrinsic/Bequest value

- Maintenance of future options

“There may be potential conflicts between local land users and the global community who value different components of biodiversity.”

Some of the benefits of biodiversity, in contrast, appear to accrue to other stakeholders, including biotechnology companies, as well as the global community which gains from the absorption of atmospheric carbon in well-forested areas. There may be potential conflicts between land users who prioritise increasing productivity through reducing plant diversity, and the broader global community. The Convention on Biodiversity, recognises these tradeoffs and emphasises the need to maximise the social and economic benefits from the protection and sustainable use of biodiversity, and their equitable distribution.

“Biodiversity protection may not be a ‘win-win’ solution for local and global communities in all cases.”

Specifically, where there are different objectives between local users and the global community, there needs to be development of mechanisms to reconcile these objectives, including, if necessary, financial instruments which “compensate” local users for maintaining biodiversity. It cannot be automatically assumed that biodiversity protection represents a win-win solution for local and global communities in all instances. In part this is a result of “market failure”, i.e. there are no market prices fully incorporating the value placed by different stakeholders on biodiversity.

As with environmental resources in general, the focus with respect to biodiversity loss should not be on local resource users alone. Much biodiversity loss is caused by the activities of large resource-extracting companies, or as a result of State-sponsored large-scale reclamation or infrastructure projects. These are examples of “institutional failure” referred to earlier with respect to CPRs.¹⁰

“Biodiversity is important for poor households to spread risks.”

There is some evidence that agricultural biodiversity is greater in areas which economically are regarded as poorer; but this does not imply a causal relationship. Biodiversity in such areas is particularly important for poorer households for spreading risks, enabling such households to generate livelihoods from a range of products. For marginalised groups maintenance of, and improved access to, agricultural biodiversity can contribute more to sustainable livelihoods than can conversion to cropping patterns with reduced diversity – in part because these groups’ traditional entitlements to such biodiversity may be stronger than their market access to the production inputs needed to support more “intensive” agricultural systems.

One of the key requirements to maintain biodiversity is to reform the system of economic incentives, institutional and policy structures which are currently geared in favour of industrial-type agricultural models and against systems promoting agricultural biodiversity. Current incentive systems, for example, provide distorted signals by failing to reflect the external effects of biodiversity loss.

¹⁰ Biodiversity is in fact an example of a global CPR, although the move towards realising value from biodiversity through patent-protected products can be seen as a move towards global privatisation of biodiversity.

“Maintenance of biodiversity requires effective local-level interventions as well as a supportive national and global framework.”

Actions to promote maintenance of biodiversity which benefits the poor need to be based on effective local-level interventions as well as on developing a supportive national and global framework. At the local level, for example, there is a need:

- To improve access to and management of natural resources to enhance *in-situ* agricultural biodiversity.
- To recognise indigenous knowledge and give farmers “voice” in terms of the orientation of research, technology development and training.
- To improve access to financial resources; and to enhance marketing systems and infrastructure so that increased use values from biodiverse areas can be realised.

Experiences of local communities in successfully maintaining biodiversity need to be documented, the lessons learned, and then replicated more widely. There remains a tension in policy between an approach favouring “pure protection” of biodiversity, if necessary excluding communities from particular sensitive areas, and an approach based on community management of biodiversity resources.

c) Linkages between Global Conventions

“There are clear links between desertification, biodiversity conservation and climate change which will have impact on the poor.”

Issues relating to climate change are not considered in detail in this document, since they are dealt with extensively in the Coherence volume of the *DAC Guidelines on Poverty Reduction*. However, there are clear links between desertification, biodiversity conservation and climate change which will have impact on the poor. Some of these linkages are outlined in Box 11.

Box 11. Desertification, biodiversity conservation and climate change: the linkages

The linkages between global and local climate, natural habitats and land degradation are many, complex and varied. At the global level, deforestation, land degradation and desertification contribute directly to increasing the concentration of carbon dioxide in the atmosphere, by reducing vegetative cover and impairing the water retention capacity of the soil, and thus the ability of vegetation to store carbon. Desertification has already caused a substantial loss of soil carbon emitted to the atmosphere. The United Nations Framework Convention on Climate Change (UNFCCC) requires Parties to the Climate Change Convention to “promote and co-operate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases...including biomass, forests and oceans as well as other terrestrial and marine ecosystems” [UNFCCC, art. 4.1(b)].

At the local level, deforestation increases soil erosion, reducing soil fertility and agricultural productivity. Since forests are habitats to a large number of species, their degradation results in direct loss of biodiversity. Land degradation is also a major cause of food insecurity.

Conversely, climate change is expected to significantly affect the resilience and productivity of many ecosystems. This will affect both land-based and marine species. Even minor changes in key environmental variables such as temperature or salinity, for example, can greatly affect the abundance, diversity and distribution of fish populations. The many interactions between biological processes and climate could therefore initiate or reinforce drought in some regions with severe consequences for the poor.

In general, these interactions are likely to have the greatest impact on those populations which rely most on natural resources for their livelihoods, i.e. rural populations, and particularly on the poor who are less able to bear the costs of adjusting.

Source: OECD (2001), Sustainable Development – Critical Issues, Chapter 9.

4. Economic growth and macro-level economic policies

Economic growth can have varied effects on poverty and on the environment. Two issues are particularly important: the extent to which growth is equitable, and the environmental quality of growth.

“Equitable economic growth reduces poverty, while inequitable growth hinders poverty reduction and may worsen negative poverty-environment interactions.”

While equitable economic growth reduces income poverty at national and household levels, inequitable growth hinders poverty reduction and may exacerbate negative poverty-environment interactions. Growth patterns which neglect smallholder agriculture, for example, may indirectly contribute to unsustainable land use practices which also cannot sustain livelihoods. Equitable (pro-poor) growth requires policies and programmes which enhance the asset base of the poor, and which enable poor people to use their assets and capabilities to improve their livelihoods.

“The environmental quality of growth is critical to poverty-environment interactions.”

The quality or content of growth, in terms of direct impacts on the environment – related to the use of inputs including environmental resources, and outputs including waste products – is also critical. The tools of environmental management can be used to ensure that a given level of growth is achieved through optimal use of resources, including environmental resources.

Macro-level economic policies and externally induced shocks are widely felt throughout the economy, often affecting poverty-environment relationships. Macro-level shocks generally do not directly *cause* increased poverty/environmental degradation, but rather exacerbate existing distortions or inequities in resource endowments. Their precise impact on poverty-environment dynamics depends on a wide range of institutional, social and ecological factors.

“Sudden economic contractions increase pressures for unsustainable resource extraction.”

The same set of macro-economic policy changes will have different impacts depending on country-specific conditions. One general tendency, however, is that sudden economic contractions, which result in high rates of unemployment, generate increased pressures to seek livelihoods from

agriculture or from resource extraction on open access resources (including forests and fisheries). The financial crisis in Asia, for example, has intensified illegal fishing activities and the increased use of illegal practices such as dynamite fishing, leading to stock depletion and severe damage to coral reefs (World Bank, 1999). In Africa, a common consequence of limited or declining economic opportunities is an increase in valuable wildlife poaching e.g. rhinos and other rare species.

This section maps out the main general linkages between macro-level policies and their economic and environmental consequences, and describes what key factors would determine the ultimate outcomes. Box 12 below reports on empirical findings illustrating these links.

a) Monetary Policy

i) Currency depreciation¹¹:

A currency depreciation will lead to increased demand for export products, including agricultural crops, as well as increases in the prices of imported inputs, such as fertilisers and fuel. The impacts of these relative price changes are often different for large and small scale producers: large-scale commercial producers, better able to seize the new market opportunities arising from improved export competitiveness, are often able to compensate for increased costs of imported inputs.

For exporters, the currency depreciation will lead to increased revenue and, where possible, expansion and intensification of production. Where export crops are labour-intensive, this may generate increased employment and income opportunities in rural areas. The environmental impacts will depend on the characteristics of the export crops, their suitability to soil conditions, and the use of chemical inputs in production. Tree crops, such as coffee, cocoa, palm, cashew, or rubber are generally environmentally desirable and do not cause soil erosion. On the other hand, the expansion of plantation crops may come at the expense of natural forests. Crops such as tobacco tend to deplete soils and involve heavy use of pesticide, fungicide and fertiliser. The processing methods used for export crops are also relevant: crops such as tea and tobacco often require large amounts of fuel wood for post-harvest drying and curing, while washing of coffee berries and palm processing can generate considerable water pollution. The ultimate environmental impact of crop expansion will depend on the balance between those various impacts.

Small-scale farmers are generally constrained by limited access to credit and to information regarding export opportunities, and by the impact of increased input prices on fertilisers and pesticides. These factors will often determine the change in competitiveness. For small-scale exporters, the impact of currency depreciation may stimulate an expansion of land under cultivation. If there is wide scope for increasing production, this will be a boon for agricultural producers. Where competition over land resources is already severe, however, it may intensify social conflicts. Poor farmers may also be unable or unwilling to diversify towards export crops, preferring the security of food crops for local markets or personal use.

The overall environmental impacts will depend on local conditions and notably on the availability of suitable land. As described previously, where this expansion takes place on ecologically fragile lands, environmental damage can be severe. Increased prices of imported fuel can also generate renewed pressure on natural forest and other sources of substitute fuels.

¹¹ We focus here on currency depreciation because it has been a feature of recent economic crises in many developing countries. In the case of currency appreciation, the arguments developed apply in reverse.

“Increased export prices may increase pressure to intensify natural resource extraction.”

Increased export prices may also increase pressures to intensify natural forests’ harvesting, as well as mining and other forms of natural resource extraction. The consequences will depend on the ability of regulatory authorities to monitor commercial operators’ behaviour and enforce existing environmental regulations. The indirect effects of currency depreciation can also be significant. Improved export competitiveness may stimulate non-farm employment in rural areas, thereby reducing pressure on marginal lands.

- b) Fiscal policy
 - i) Price and subsidy reform

“Price and subsidy reforms can have a wide variety of effects on poverty-environment linkages.”

Price and subsidy reforms can have a wide variety of effects, depending on which stakeholders are most affected, and on the scope for users to react to price changes by substituting different inputs. In any price reform, subsidy removal or other fiscal reform, a complete analysis is needed to identify how the funds made available, for example by a reduction in subsidies, are allocated to other uses. Such analysis has to be made on a case-by-case basis. The following section reviews briefly the possible impacts of the most common forms of price/subsidy reforms.

Fuel subsidies: Subsidy reduction will generally promote more efficient use of energy. In urban areas, this may also lead to pollution reduction. The socio-economic impacts will depend on whether the heaviest users, and thus beneficiaries of the subsidy, were primarily among the well off or the poorest segments of the population. In many countries, fuel subsidies primarily benefit urban populations. The environmental impact will largely depend on the scope for procuring substitutes, e.g. energy efficiency devices and fuel wood. There is a risk that fuel wood may be collected from open access areas, which could accelerate depletion. On the other hand, where open access land is rare and property rights well defined, increased fuel prices could foster the plantation of fast-growing trees for fuel, thereby generating new income opportunities.

Food subsidies: The removal of subsidies on foodstuffs will often affect urban populations which, as non-producers, will have to pay relatively higher prices. The socio-economic impact will depend on compensatory measures (e.g. income support for the poorest both in rural and urban areas). Rural producers will often have to produce more to keep up income levels. The environmental impact will again depend on the scope for increasing production sustainably.

Subsidies on agricultural inputs: Subsidies on agricultural inputs: the social and environmental impact of a reduction in subsidies for agricultural inputs depends on a variety of factors. These factors include e.g. the intensity of use prior to subsidy removal (for instance, subsidies may lead to overuse of pesticides); the design of the subsidy prior to its phase-out (‘crude’ forms of input subsidies often tend to favour large-scale farmers); and the responses available to farmers (which may include extensification of land use through encroachment of marginal lands). Only a location-specific analysis will allow to determine the outcome in a particular case.

Water subsidies: Water subsidies in rural areas tend to favour the large-scale commercial farmers. As the removal of subsidies will lead to more efficient water usage and thus less depletion of resources, this could mean that more water would be available for smaller farmers.

Introduction of polluter charges, user fees, etc. The impact of measures to internalise environmental externalities through market instruments such as taxes, user fees and the like hinge on the effectiveness of regulatory instruments and institutions. This includes, for example, the ability of responsible authorities to combat illegal practices, collect applicable fees, and monitor private sector users' compliance with environmental regulations. With weak regulatory and monitoring capacity, even the best-designed market-based instruments are ineffective.

ii) Public expenditure reduction

Structural adjustment measures often include important reduction in public expenditures, including the reduction of the budgets of public administrations and/or the devolution of their responsibilities to regional and local levels. Two principal types of environmental impacts resulting from this can be identified:

- **Direct impact:** weakening of environmental monitoring institutions. Staff and budget reductions in the institutions responsible for environmental management can further weaken their ability to manage natural resources and enforce existing regulations. This is often combined with increased pressures on natural resources resulting from other effects of structural adjustment measures, e.g. increased unemployment.
- **Indirect impacts:** large-scale increase in urban unemployment. The combination of policies to restore macroeconomic stability, streamline the public sector and privatise public enterprises, often results in sudden increases in urban unemployment. Where compensatory safety nets are weak, urban households often resort to seeking assistance from extended family networks in the rural areas. On a large scale, this can considerably exacerbate existing pressure on open access natural resources (land, forests, coastal fisheries etc.)

“Structural adjustment measures can reinforce existing root causes of environmental degradation.”

Thus, structural adjustment measures can reinforce existing root causes of environmental degradation such as already weak regulatory institutions and framework and pressures towards unsustainable management practices.¹² Some evidence for these outcomes is presented in Box 12.

12. Given this, the IMF argues that “Despite the positive role that IMF advice on macroeconomic policy and structural reform often plays, the IMF recognises that protecting the environment in its multiple facets may require more than just macroeconomic and structural reforms aimed at ensuring macroeconomic stability. Indeed, it is possible that some IMF-supported macroeconomic and structural reforms, instead of furthering the environmental objectives, may sometimes have an adverse impact on some aspect of the environment. The appropriate solution in such situations is for the country to adopt adequate and effective environmental policies as a complement to macroeconomic and structural reform.” (Gandhi, 1998)

“WWF research indicates negative effects on poverty and the environment from some elements of structural adjustment.”

Box 12. Findings of the World Wild Life Fund (WWF) research on the effects of structural reforms

The WWF has carried out two studies analysing the impact of macroeconomic structural reforms on poverty and the environment. Based on evidence from Cameroon, El Salvador, Jamaica, Mali, Pakistan, Tanzania, Venezuela, Vietnam and Zambia, the WWF has come to the following conclusions:

- Price corrections often do not realise the potential for effective positive economic *and* environmental outcomes, because they are not accompanied by complementary policy and institutional reforms. The removal of some but not all subsidies, an unwillingness to internalise environmental costs, the failure to correct legal and land tenure problems, and the omission of transitional mitigation programmes, all need to be addressed through policy reforms that would then strengthen the positive effects of price corrections.
- Macroeconomic reforms have tended to increase the number of poor and to cause further deterioration in their economic and social situations relative to the better-off. The rural poor have not been able to respond well to the changing relative prices for their products, the rising input prices, and the reductions in social services, extension and credit services, and have therefore experienced a serious erosion of their income earning ability.
- The short-term effects of adjustment often include higher costs for a variety of basic commodities and a decrease in formal employment. In spite of compensatory social programmes as an immediate safety net for the most vulnerable sectors, there has been little evidence that the economic growth over the long-term has been sufficiently high to lead to employment increases throughout the economy and to better income distribution.
- The growing number of poor informal workers frequently move back and forth between rural and urban settings. In their struggle to survive, they intensify pressure on environmental assets at unsustainable rates.
- Fiscal retrenchment of the State has marked a reduction in its ability to redistribute wealth and opportunity. In the medium and long terms, this implies that policymakers will have greatly reduced options for addressing the basic equity and environmental integrity objectives of their societies.

Source: Macroeconomic Policies, Poverty and the Environment, David Reed and Fulai Sheng, MPO, WWF.

D. Tackling poverty-environment-gender challenges: key approaches and policy implications

“A critical requirement to reverse resource degradation is to provide communities with a clear stake in using resources sustainably.”

Many forms of environmental degradation have impacts at watershed, regional¹³, national or even global levels, such as soil erosion and biodiversity loss, and require responses at these levels.¹⁴ However, efforts to prevent or reverse resource degradation and decrease poverty are likely to be less effective unless they also address the needs of local resource users. This involves enhancing the capacity of the rural poor to respond to the pressures discussed in the previous sections. A critical prerequisite is also to provide communities with a clear stake in using resources sustainably. This, in turn, involves increasing security of tenure over resources critical to the poor and enhancing benefits from sustainable resource use. This will entail improving access to markets, finance, social services, health, knowledge and information. In all of these areas there is a fundamental need to ensure that women are benefiting on an equal basis. Land tenure legislation, even where it has been reformed recently, often discriminates against women in terms of their rights to land. Credit markets also tend to operate more in favour of men, although the development of micro-finance institutions with a specific remit of lending to women has helped to redress the balance in some areas.

This section summarises some of the key institutional and policy factors to consider in improving the ability of the rural poor to achieve sustainable livelihoods.

1. Improved security of resource tenure

“Improving security of tenure is essential.”

Improving security of tenure over resources is essential to empower users to make their own management decisions, create incentives for sustainable use, and to enhance the scope for livelihood options. Also, in many cultures, secure resource tenure is a critical factor in securing social recognition. Secure tenure enables the resource users to enjoy the benefits from efforts to maintain and improve the resources at their disposal.

Security of tenure is critical to give users assurance to undertake the costly investments in know-how and infrastructure that are necessary to ensure long-term resource productivity. For instance, it is essential for farmers to be able to invest in the labour-intensive work of construction of terraces or bunds to control soil erosion, to grow long-gestating tree crops, or to plant hedges, or for fishers to mark and patrol fish sanctuaries.

Providing secure tenure over squatted land may be necessary to stabilise the agricultural frontier and encourage populations to settle and stop expanding into fragile or threatened ecosystems. It could encourage the infrastructural investments necessary to integrate communities in remote areas. Tenure reform can also contribute to alleviating conflicts by providing peaceful and legal means for resolving land-related disputes. This may reduce the incidence of land encroachment and violence.

¹³ Deforestation, watershed degradation, or soil-eroding agricultural practices increase siltation rates downstream and exacerbate flood-drought cycles. Run-off from fertilizers and pesticides can contaminate downstream water supplies.

¹⁴ Global issues, such as climate change are addressed in the “policy coherence” section of the poverty guidelines. Thus, they are not covered here.

Box 13. Tenure reform: principles and objectives

Resource tenure may be defined as the terms and conditions on which resources can be held, used and transacted. Tenure rights generally include rights to occupy an area; to use land for annual and perennial crops; to make permanent improvements; to access the land for hunting, fishing, or collecting wood, wild fruits, minerals and other products; and to exclude others from these uses. Benefits of secure tenure also generally include the right to sell, give, lease, rent and bequeath or otherwise transfer a property, and the ability to borrow money using the property as collateral. Formal tenure can be given to a community or an individual, and those people must be able to exclude other individuals, companies, and the government from using or expropriating their resource.

Land tenure reform may include a change in the terms and conditions governing the contracts between landowner and tenant, the formalisation of traditional rights to common property resources, or the provision of formal usufruct rights for people squatting on state-owned land.

Land tenure reforms should be based on a thorough understanding of the livelihood strategies of those they are intended to benefit. The scope for exploitation by local elites and officials must be recognised. It should be considered that corruption, incompetence and indifference can also deprive the poor of the rights they already theoretically enjoy. The formalisation of rights to communal land should underpin the adaptability and responsiveness of existing customary systems and not constrain local coping strategies.

Customary systems are not always equitable, but they do constitute an important starting place for negotiating better rights for the poor, but unless care is taken in the formalisation of policies and processes, poor groups, women, and nomadic communities can lose out as a result.

There are alternative policies to land or tenure reform that might help secure broad access for the poor and landless to resources:

- **Regulatory reform** includes, for example, lease or harvest agreements for both private and public lands to facilitate access and encourage resource conservation and management, longer-term rental contracts, explicit agreements about the distribution of benefits from resource improvements.
- **Water right reform** can ensure more secure access by the poor and landless, yet also value environmental uses of water.
- **Land use planning reform** involves including different groups of poor people in longer-term land use planning efforts to ensure that their existing use patterns and future needs can be met without increasing poverty or resource degradation. This includes, for example, establishment of formal agreements for access to critical environmental resources for the increasing number of refugees (e.g. from drought or disasters) to limit local over-exploitation and conflict.

“Tenure security must provide women with the same options as men.”

Efforts to improve tenure security must strive to provide women with the same options as men. In many cases, land is registered in the name of men only, regardless of who is actually using the land. Moreover women may be thrown off the land in the case of their husbands’ deaths or the land will be distributed directly to the male children only. Thus, female-headed households and wives are frequently excluded from receiving land titles, even if they are the sole users of their land. Communities may need assistance to understand the need to implement gender equality. Where local authorities are reluctant to enforce women’s user rights, judges and lawyers can be included in an effort to change customs, regulations, or laws that prevent women from controlling, owning, or

inheriting resources to the same degree that men can.¹⁵ Civil society organisations can play a key role in informing rural women of their legal rights and in supporting them in using these rights.

Land tenure reform can be a costly and time-consuming process that requires thorough public involvement and careful preparation. Interventions may have to focus on the more densely settled environmentally fragile areas and first address situations that are a direct threat to livelihoods or political stability. The necessary institutional development can take many years or decades, and the costs of delay or neglect are high. The process is far more likely to succeed if the rural poor are involved in designing and implementing the system in an open and participatory process. Explicit efforts may be needed to ensure that all groups which will be affected are represented.

“Rural communities may need to be informed of their rights and supported to maintain them.”

Provision of formal tenure rights to rural poor people is not enough. They may also need assistance to work with local police, the Coast Guard, or regulators to enforce their tenure rights, to identify and stop unauthorised harvests, or illegal dumping of industrial waste. Rural communities may need to be informed of their rights. The judiciary may need assistance to strengthen the capacity to prosecute violations of tenure rights. Local and national governments may need assistance to remedy legislation that undermines traditional arrangements, or to formulate instruments for the joint management of resources with communities. NGOs may need help to develop the capacity to advocate on behalf of the poor for adequate enforcement of tenure rights.

2. *Improved access to markets*

“Access to markets is essential to enable the poor to realise benefits from their resources.”

Secure tenure is necessary but not sufficient to enhance options for sustainable resource use. Access to markets is essential to enable the rural poor to realise the potential benefits from their resources. This requires, initially, investment in improved transportation and communication infrastructure and services. It also requires access to information about how and where to market farm products, handicrafts, non-timber forest products, tourism opportunities, organic produce, etc., which can open new market opportunities for the poor. This is not only relevant for the sale of farm produce, but would also serve to stimulate non-farm employment from entrepreneurial and cottage industries in rural areas. However, for poor men and women to benefit, they are likely to need help to identify and navigate government regulatory processes to obtain necessary licences and permits. Government agencies can also evaluate permitting and licensing processes and simplify regulations and paper work, and decrease the time needed to obtain such papers.

“Integrating markets can enhance livelihood options.”

Integrating markets can open up a large number of livelihood options ranging from the production of high-value tradable produce (e.g. tree crops instead of subsistence crops) to seasonal migration. Access to markets allows the rural poor to obtain less expensive inputs and to diversify

¹⁵ There must also be awareness that, even where women receive the same formal rights to land as men, they may not enjoy the same access to productive resources (labour power, inputs, credit etc.) and may remain disadvantaged. Legal actions therefore have to be accompanied by other measures to ensure that women can make productive use of the land they are entitled to.

crops, e.g. towards more land conserving crops. Organically produced goods constitute a growing niche that could be developed. Greater access to markets could also enable forest dwellers to sell both timber and non-timber forest products, and to increase the value of timber by marketing to the higher-priced “green” markets. Easy access to export markets could enable fishers to increase the value of fish catches, providing increased incomes and incentives to maintain fish stocks and reefs, and thereby ensure future catches.¹⁶ Improved access to markets also facilitates access to a range of essential social services such as health, education, etc.

Moreover, there are important gender dimensions. Lower literacy, less mobility, less available time, and other constraints together result in women having less access to markets and other information compared to men. Supporting communities to value and market women’s products as well as men’s will enhance the resource value for a community, or a family. In this regard women’s preferences may in fact be less for marketable crops than for crops for domestic use, for example certain tree species. Such preferences can have positive environmental impacts in reducing pressure on common forest areas. Control of income within the household is an important and complex issue: if women have an independent source of income, this will be beneficial to household welfare, and in the long term to reduced resource degradation, since a high proportion of such income will be spent on necessities such as health expenditures, school fees etc. which enhance human capital. This may be less the case if increased income is held by men.

“But market orientation can also expose poor households to increased risk.”

Lastly, a word of caution is necessary: a number of initiatives have been launched to encourage trade in particular products for industrial or niche export markets. However, such efforts have often proved to be vulnerable to change in market requirements and/or to domination by intermediaries. These market requirements can therefore expose rural households to high levels of risk, particularly where the trade has encouraged people to move away from more diversified and less risky agriculture-based livelihoods. Furthermore, there may be adverse environmental consequences from opening up areas for example through the enhancement of the road network: increased logging, over-exploitation of wildlife resources etc. may result unless these consequences are understood and planned for in advance.

Box 14. Market promotion of forest products by smallholders

Although most poor farmers give priority to trees that help meet subsistence and protection needs, support for farm forestry encourages planting of trees for timber. This is often reflected in a strong promotion and extension efforts by forest departments, a focus on a small range of industrial tree species, subsidies for planting, and information about prices that generally make tree crops appear more attractive than agricultural crop alternatives.

In addition, while providing support to production by smallholders through one part of its forestry programme, the state often competes with them through the industrial forestry component. In the short term, the scope for improving the position of smallholders probably lies mainly in removing or relaxing regulatory constraints that reinforce the structural and scale advantages that the state possesses, as a producer of many forest products through its forest department. A logical long-term solution could be to phase out state production in those markets where smallholder production has a comparative advantage.

¹⁶ However there is evidence from some fisheries, for example from Lake Victoria, that access to export markets and increased incomes do not provide sufficient incentives for sustainable management, in part because of the ease of access into the fishery. Additional measures, possibly including development of co-management systems between resource users and the State, appear to be required in these cases.

In some areas, eco-tourism and low-impact tourism can promote biodiversity conservation while providing a source of income for rural communities. Eco-tourism can be particularly useful where wildlife is abundant, competition with communities is intense, and the options for alternative livelihoods, notably agriculture, are limited.

Box 15. CAMPFIRE Projects

Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe seeks to involve rural communities in conservation and development efforts by returning the stewardship of their natural resources to them and by harmonising the needs of rural people with those of ecosystems. CAMPFIRE depends on hunting revenues, largely from trophy hunting, which contribute over 90% of total income to the participating districts and communities. During drought years, money tends to be distributed mainly as household incomes. In more abundant years, funds are directed towards community development projects such as building roads and clinics, installing grinding mills and drilling wells. The CAMPFIRE programme is currently diversifying into the protection and sustainable use of mopane worms. This will include special efforts to engage women.

Source: CAMPFIRE (no date given).

3. Improved access to knowledge and technology

“Resources have not been focussed on marginal areas, although about 65% of rural populations in developing countries live in such areas.”

Efforts to enhance farm production generally concentrate on zones with high agricultural potential. The inherent difficulties and seemingly low returns involved in raising sustainable production under adverse biophysical conditions have tended to deflect attention from low-potential marginal lands, despite estimates (CGIAR, 1997) that 65% of rural populations in developing countries, and probably a similar percentage of the rural poor, live in such areas.¹⁷

Many of the most severe forms of environmental degradation, including depletion of biodiversity, deforestation, loss of wetlands, and soil erosion, are concentrated in marginal agricultural areas. Resource degradation is sometimes the result of poor farmers trying to survive in marginal areas, with few resources and inappropriate technologies. Lack of knowledge of sustainable farming and harvesting techniques and crops pose particularly acute problems for migrants or people displaced to environments they are not familiar with.

With the aim of putting fragile lands to productive use, new techniques and technologies will often have to be developed and disseminated, for example building up organic matter, land levelling, and conservation investments. These should also focus on lowering costs of variable inputs (nutrients, labour for field preparation and management) and on lowering costs of conservation investments. Perennial tree and shrub crops are particularly promising in this connection. Conservation investments

¹⁷ The extent of production and rural population living in marginal lands, and relying on what is termed complex, diverse and risk-prone (CDR) agriculture should not be neglected. Pretty (1995) refers to CDR agriculture as the “forgotten agriculture”, yet he estimates some 2 billion people are dependent on the type of agriculture practiced in CDR areas. Research, technology development and advisory work needs to focus to a much greater extent in such areas.

often require the mobilisation of social capital,¹⁸ for example where conservation is being implemented at catchment level.

Box 16. Reducing vulnerability to degradation with tree and shrub crops

Perennial tree and shrub crops, which provide year-round vegetative cover and do not need regular cultivation, are particularly promising for the rehabilitation and sustainable use of fragile lands by low income farmers. They have flexible harvest demands and produce a variety of natural vegetation. Examples include biomass energy plantations, palms or bamboos for multiple purposes, shelterbelts or streamside plantings producing poles or timber products, fruit trees, and managed farm or community wood lots.

Economic operation on smallholdings requires some technical assistance, possibly including targeted initial subsidies and development of marketing channels. Subsistence food production must remain part of the system (possibly through agro-forestry systems), to ensure household food security. Tree plot strategies seem most likely to succeed where there are active, high-volume markets for tree products, fairly good market access, and farm size of at least a few hectares.

“Agricultural research, extension and education should be re-directed towards improving land management systems in marginal areas.”

Re-directing agricultural research, extension and education towards improving farming systems and land management practices in marginal or fragile lands would play an important role in supporting the transition towards sustainable use. This would require a conscious reallocation of research efforts away from the most favoured environments and toward the environments upon which many poor women and men depend. This work could include identifying high-value marketable crops suitable for fragile environments, and disseminating knowledge of improved farming methods and soil conservation techniques especially among recent migrants. However, food security remains important in such areas, and there is a need to recognise and enhance the properties of “traditional” food crop varieties developed by farmers as adaptations to harsh environments.

“Agricultural research and extension systems need to adopt more participatory approaches, working with smallholders.”

More generally, there is a need for agricultural research and extension systems to adopt more participatory approaches which involve working with smallholders, including identifying useful indigenous techniques and technologies and farmer-led innovations which can be replicated.

Specific research is needed to raise the productive potential of farm components through innovation on soil nutrient management, livestock feeding strategies, promotion of low-risk perennial production in poor and marginal areas, for example biomass energy plantations, palms and bamboo. Also, information on establishing fish sanctuaries and using larger-mesh nets could help fishers increase fish catches over time. Training in modern timber harvesting methods could enable forest dwellers to maximise the sustainable harvest of their forests and market timber for the high-value ‘green’ market. Evidence shows that the poor generally have an enormous store of indigenous technical knowledge that could be utilised in this research.

¹⁸ Social capital refers in this context to organisations at local level which can ensure collective action to achieve community benefit. Such organisations may already exist, or else animation efforts to organise communities needs to be undertaken.

“Gender differences need to be taken into account in research, extension and education systems.”

Gender differences should be taken into account in research, extension and education systems. Even in cases where women are the principal farmers, extension agents usually give information to men with the often mistaken expectation that they will convey it to the women. It is important to work directly with the people involved in farming at a time and under circumstances that are convenient for them.

4. *Improved access to finance*

“Micro-credit is a key input.”

Credit is already recognised as a priority area to foster development in the rural sector. Many credit schemes emphasise micro-credit loans to enable individuals and households to widen their income-earning options. The availability of credit can reduce the risks involved in switching to new produce that might be more suitable for the soil and provide a new source of livelihood, such as certain tree crops. Poor farmers may be less able to accept the risk of switching to tree crops, as land dedicated to trees may produce no income for many years, and market prices for many tree crops, such as cocoa and coffee, are highly variable.

However, micro-credit alone rarely increases incomes sufficiently to raise people out of poverty. It has a greater impact when combined with assistance to develop business and marketing skills, to identify markets for locally produced goods, and to best utilise or purchase land. Another financial mechanism that may assist the poor in the transition to slow-yielding perennial crops is the development of insurance systems, such as cash payments, food security systems, in-kind provisions or public works employment. Such systems can also help during periods of drought or major crop failure, as they can provide for subsistence needs without over-exploiting natural resources (see Box 17 which discusses the use of different financing mechanisms to overcome the problem of high discount rates amongst the poor). The insurance system could be financed from premiums and/or supported by public funds. Although crop or livestock insurance has not had widespread success in developing country agriculture, if well designed, it can be an important risk-reducing mechanism with positive effects for poverty reduction and protection of the natural resource base.¹⁹

“Where poor people have high discount rates, provision of credit and other supports can reduce pressures to degrade resources.”

Box 17. Measures to address high discount rates

It is often said that poor people discount the future at a high rate and that this is a reason why environmental resources are degraded. If people are not concerned with future benefits, they are more likely to use resources unsustainably. There is little clear evidence to uphold this assertion in general, although it may hold under some circumstances. However, it could just as plausibly be argued that poor households, because of their high level of dependence on environmental resources to meet basic livelihood needs, have stronger incentives to protect those resources than other households or economic agents. There is evidence that in some cases – notably logging, but also for example in the growth of unsustainable shrimp production – it is well-off economic agents who effectively have high discount rates and adopt a “mining” approach to the resources.

¹⁹ Another important element of a risk-reducing framework, although not a financial mechanism, is the development of effective Drought Early Warning Systems.

There may be circumstances, however, where poor households do degrade their environment: for example, where there is a breakdown of traditional rules governing use of CPRs, and where resource use becomes a “free-for-all”; where extreme poverty does cause poor households to have high discount rates purely as a matter of immediate survival; or where lack of capacity to invest in necessary land conserving structures results in land degradation. In the latter case there can be grounds for subsidising – for example through Food- or Cash-for-Works programmes – the costs of the initial investment, given the positive externalities which would result.

If there are high discount rates then other measures can be taken to lower them. These can include the subsidised support noted above, the fostering of social capital to promote collective action in favour of resource protection/enhancement, or financial measures, e.g. the provision of credit, allowing households to smooth their consumption over time and thereby reduce pressure on resources at times of low production. Simple insurance schemes or other risk-reducing measures would have the same effect.

“Women generally experience greater problems than men in gaining access to credit.”

Efforts to improve access to finance for the rural poor must consider gender differences in needs and access to be equitable and to reach all the rural poor. In many places, women are not legally or culturally allowed to hold land title or other assets, or the title of assets is in the name of the male head of household (see Box 18). In these cases, women are less able than men to offer collateral to obtain a loan. This problem can be compounded if the man has migrated to a city to work – the woman may not be able to use assets that are in his name as collateral. This means that a woman, who is responsible for running a farm, might not have access to the credit needed to buy fertiliser, to cover increases in agrochemical costs, or to invest in new tools or more sustainable crops. A related problem is that women may not be informed about how to access and use credit, or may be excluded from groups that provide access to credit, such as farmers’ groups. The time-cost to get credit may also be greater for women than for men, because women often have less spare time than men do

Box 18. Examples of gender-based constraints that women face to obtain credit

In Pangasinan and Bataan, Philippines, women earn 35% and 25% of household income from their fishing efforts, respectively. However, men own the fishing boats that could be used as collateral for a loan. In this situation, improving the credit market may help men, but a different mechanism would be needed to assist women. In Kenya, the distance to a bank significantly affects women's abilities to obtain credit, without affecting the men's, because women have less spare time than men. In Zaire, a woman needs her husband’s consent in order to open a bank account.

Source: Gambill, David (1999)

Efforts to improve access to credit will have limited impacts if not backed by macro policies that support financial markets and facilitate the spread of self-sustaining rural financial institutions. This includes establishing banking criteria with regard to savings and loans, and the appropriate regulatory and guarantee provisions. Most public rural farm support institutions, such as agricultural extension, research, and credit systems are not well organised to serve the poor, and the private sector institutions, which increasingly replace them, do not necessarily consider the poor to be their clients. Therefore special efforts in planning and service strategies are often needed to reach the poor. These

efforts may include support for the development of micro-financing institutions, for example based on the Grameen Bank model which overcomes the need for conventional forms of collateral, and which also emphasises making credit available to poor women in particular. Such institutions are resource-intensive, however, and need to be very well planned to be successful.

5. *Improved participation in governance*

“Poor people are often excluded from decision-making on resource use.”

Poor people are often constrained in their ability to influence government decisions that affect the resources on which they depend. This creates uncertainty about their future access to resources and undermines incentives to use their resources sustainably. Specific efforts are required to enhance their full participation in decision-making processes that will affect their resources, e.g. citizen oversight boards and community-level review processes for dispute resolution. Governments often neglect the gender dimensions of decisions made on resource use, and particular efforts need to be made to enhance women’s participation in decision-making processes.

In many cases, the poor already have the formal right to manage key environmental resources, but they are not able to protect their rights, either because they are not aware of them or because they are unable to defend them. Individuals and communities need to be informed of their rights and of the scope for influencing government policies through participation in political processes. Government institutions must also be proactive in disseminating information, seeking public input, and in working with local communities to identify and meet local needs. Many communities have become more effective in interacting with government decision makers after being trained in such skills as talking in public fora, negotiating, and organising public meetings. Civil society organisations can often play a critical role in supporting community-level capacity development for protection and sustainable management of natural resources. Box 19 refers to the increased development of community-based natural resource management programmes, often with donor and NGO support.

Women often face special difficulties participating in local political processes. Social constraints often prevent them from attending and/or speaking openly in meetings with men, or men ignore the women when they do. Efforts to involve the rural poor in governance will need to explicitly involve women.

“CBRM programmes are improving communities’ abilities to manage resources sustainably.”

Box 19. Some lessons learned from CBRM programmes

Community-based resource management programmes (CBRM) are improving communities’ abilities to manage their resources sustainably. These programmes help communities to increase their economic benefit from these resources, and to explicitly recognise the link between these benefits and the resources. The programmes help communities build the skills needed to manage their resources, identify new income opportunities, improve the ability of communities to enforce their resource rights, and influence decision making. The programmes help government authorities at all levels to institute the policies and regulations needed to support community efforts to manage resources sustainably, and also help local governments establish mechanisms for citizens to participate in planning and decision making. The interaction of local resource users with relevant government authorities, constitutes a system of co-management, which has been shown to be effective, for example, in forest and fisheries management in many areas (see also Box 20).

Experience has shown that local resource users must be involved in deciding how to use local resources to ensure sustainable use. To succeed, local resource users should work closely with local authorities on a range of issues, such as: enforcing access to and use of resources; altering bureaucratic systems; increasing competition among buyers for products from resources; providing technical support to communities managing and enhancing communal resources; etc.

Government officials often need to better understand the social and ecological constraints faced at the local level in order to support local resource management. Capacity development efforts can assist this better understanding, which should increase political will to avoid policies that lead to misuse of resources or inhibit the rural poor from improving their livelihood. Co-management of natural resources between the State and local resource users provides a framework for sustainable management which at the same time enhances the livelihoods of poor people (see Box 20).

“Effective decentralisation needs to be supported through upgrading of local capacity.”

Decentralised administration may be required to ensure democratic participation, e.g. in the administration of taxes and on deciding priorities for the use of revenues. In order for decentralisation to truly reflect the needs of the poor, however, it will be necessary to invest support in local level capacity, otherwise decentralisation may just place power in the hands of the local elite. To ensure that vulnerable groups are not further marginalised, the understanding of norms, values, attitudes, rules and regulations underlying decentralised decision-making at the community level is necessary. It is also important to strengthen the *judicial system* as an impartial and independent institution, and to foster the emergence of institutions of civil society that can mediate between different actors. Again, capacity development in support of these elements of local governance is required.

“Co-management, for example between resource users and the State, can resolve problems of overlapping claims on resources.”

Box 20. Co-management of natural resources as a means of conflict resolution

Multiple stakeholders, with conflicting interests and objectives in local resources, lay overlapping claims on resources. Co-management could be a response to dealing with such conflicts. Such working partnerships are based on agreements between local users and the authorities, often with a role for NGOs or community-based organisations as mediators and capacity builders. The basic logic is to place resource users in control of the resources they depend on - for example irrigation management is placed under farmers' control, as a result of which it is expected farmers will mobilise more resources for its management and use water more efficiently.

The options for the State range from it simply abandoning its leading role, to moving into highly structured co-management arrangements including benefit-sharing with local communities.

An example would be a joint forest management program, which could set up village protection committees, establishing and monitoring of management plans by the forest department, confining local use to grass and non-timber forest products, and potentially sharing the income from the timber sold by the forest department. The state could act as an adjudicator in disputes between stakeholders, and provide technical, financial and institution building support to the local management body. This approach is favoured by governments that wish to continue to exercise a regulatory role (important where there are environmental externalities associated with the use of forests or forestlands) and to retain control over resources of direct value to the State (e.g. timber and forestland).

Many projects require close co-operation with the local private sector. At field level a particular challenge lies in the development of the partnership with the private sector. This sector can contribute to poverty alleviation and sustainable management in three main ways: the provision of infrastructure, taxation (e.g. social responsibility agreements by concessionaires), and the creation of local economies that open up new opportunities for the poor. There is a clear need to work with the private sector to ensure that the principles of equality and sustainability are adhered to and there is a role for the public sector to influence and monitor the participation of the private sector.

II. POVERTY-ENVIRONMENT-GENDER LINKAGES: THE URBAN CONTEXT

A. Introduction

Rapid urbanisation was one of the most significant demographic and social changes in the 20th century and will continue in this one. About half of the world's people are estimated to live in cities in the year 2000 (2.9 billion out of a total of 6.1 billion), a figure expected to rise to 59% by 2025 (United Nations, 1998, cited in OECD, 2000). Developing countries are urbanising at faster rates than OECD countries. In the past, this was primarily driven by the migration of rural population to urban areas in search of better opportunities. Today, however, most of urban population growth results from natural growth rather than migration. Therefore although enhancement of rural livelihoods would, amongst other beneficial effects, alleviate some of the population pressure on urban areas, rapid urban growth can still be expected, with all the attendant poverty and environmental problems associated with that growth. Rural-urban migration remains an important source of urban expansion, and a high proportion of migrants are likely to be poor people moving from a lack of opportunities in rural areas. Many of these will move into the urban informal sector. Although conventionally it is assumed that most migrants are men, there may be an increasing share of women also moving to urban areas.

Cities often account for a disproportionately large share of national economic production and are the main source of economic growth in many developing countries. The concentration of economic growth in and around the major cities often contributes to inequitable growth patterns which may have limited impact on poverty reduction, while aggravating environmental problems. However, while the focus of attention is often on relatively large or mega-cities (with population of over 8 million) the majority of urban dwellers in most developing countries actually live in intermediate cities (with populations of 20,000 to 250,000) and small cities and towns (with less than 20,000 inhabitants). The scale and nature of environmental problems faced by poor households will vary with the size of the urban area, nature of economic activity located there, availability of housing and water supply, etc.

“Assisting developing countries to address urban environmental problems can contribute to key development co-operation goals.”

Assisting developing countries to address urban environmental problems can significantly contribute to key development co-operation goals, such as reducing poverty, increasing gender equality and making development more sustainable. Thus, it can directly contribute to meeting the development goals outlined in the OECD/DAC's *Shaping the 21st Century: The Role of Development Co-operation*, as well as the UN-sponsored Agenda 21 and the Habitat Agenda.

To maximise the contribution of urban development to sustainable development the approach needs to involve both:

- Reducing environmental hazards within cities. This includes reducing water and air pollution and improving access to basic services for urban citizens.
- Minimising the negative impacts of urban-based activities beyond their boundaries and on future generations. This includes avoiding cities dumping their waste untreated, overexploiting distant water resources, and promoting energy efficiency to keep down greenhouse-gas emissions.

“Urban-rural interactions with respect to environmental impacts must be recognised.”

In addition, there is a need to explicitly recognise urban-rural interactions with respect to poverty-environment linkages. Positive rural-urban interactions can contribute to poverty reduction in both rural and urban areas, by expanding economic activity and enhancing livelihood opportunities. However, these positive linkages cannot be taken for granted. Evidence suggests that a number of factors contribute to positive rural-urban linkages, including suitable ecological conditions for production of high-value crops, a relatively equitable land holding structure, an efficient and affordable transport infrastructure, access to markets for small farmers, and decentralisation of decision-making to address local priorities and overcome conventional rural-urban administrative divides. Positive rural-urban linkages may reduce pressure on natural resources in rural areas, although evidence is not categorical in this respect.

Migration between rural and urban areas is an increasing component of livelihood diversification strategies. This migration is not all one way: low-income urban residents in particular may undertake seasonal or temporary migration to rural areas, as well as urban subsistence farming and peri-urban agricultural wage labour. Extended households make use of their members in both rural and urban areas, with intra-family flows of food moving to urban areas and money being remitted to rural members. There are also new patterns of rural-urban migration, with young women increasingly involved in such migration.

“Urbanisation processes are particularly intense in peri-urban areas, possibly with negative environmental and livelihood consequences.”

In peri-urban areas, urbanisation processes are particularly intense, and there can be negative environmental, and possibly livelihood, consequences. Some of the key processes include:

- Changes in land use which drive up land prices and may result in low-income groups being squeezed out.
- Changing farming systems and patterns of labour force participation: small farmers may be squeezed out by larger commercial farming operations, given the profitability of peri-urban agriculture; It should be borne in mind, however, that these large commercial farming operations will still demand agri-cultural labour this may however generate more demand for agricultural labour.
- Changing demands for infrastructure and pressure on natural resource systems.

There are major variations in the characteristics of peri-urban growth, for example between large urban areas in Southeast Asia where agriculture, small and large industry, and residential development occur side by side, and much of Sub-Saharan Africa where peri-urban growth is still dominated by agriculture, although in some cases dominated by commercial operators.

“Urban areas can have strongly negative ecological impacts on their hinterlands.”

Urban areas draw heavily and to an increasing extent on their surrounding regions, for example for freshwater resources, electricity generated through hydro-power, fuelwood etc. In addition, urban areas contribute urban solid and liquid wastes and often air pollution to the surrounding areas. They can therefore have strongly negative ecological impacts on their hinterlands.

Strategic management of the interactions between urban and surrounding rural areas is essential to maximise positive linkages and minimise negative environmental impacts. Issues relating to development of physical infrastructure, management of natural resources and wastes, and policy with respect to land use and ownership issues in peri-urban areas, need to be addressed carefully, through a coherent set of policies at different administrative levels. A narrow urban-centric approach will not be adequate to address these interactions.

B. Key interactions between poverty, the environment and gender: the urban context

1. *The poor suffer particularly through the negative impacts of urbanisation*

A large and growing share of city dwellers in developing countries are urban squatters. It is estimated that there are currently over a billion people living in shantytowns. These informal settlements are generally located in marginal areas, often in the vicinity of industrial sites or waste dumps, along railway lines or waste canals, or areas vulnerable to landslides or floods. Lying outside the areas zoned for development by city authorities, shantytowns are ill-equipped with basic infrastructure, such as roads and drainage, and have very limited access to such basic services as water, sanitation and garbage collection.

“The urban poor are disproportionately exposed to pollution and disease-causing agents”

Urban poverty is therefore accompanied by a high degree of exposure to various water and air-borne disease-causing agents resulting from unsanitary conditions and overcrowding. The urban poor are also highly vulnerable to accidental events such as fires, heavy rain, etc. In comparison with higher income groups, poor women and men also spend more time commuting in public transport and spend more time outdoors. They are thus more exposed to air pollution from transport and industry. The severity of socio-economic deprivation in many cities is further reinforced when factors such as psychosocial health problems, drug and alcohol abuse and exposure to violence are taken into account.

2. *The urban poor are especially threatened by natural disasters*

“The urban poor are more vulnerable to natural disasters.”

The urban poor are more vulnerable to natural disasters, particularly in the bigger cities. They are often forced to build on steep, marginal land prone to landslides, resulting every year in many dead and thousands made homeless as a result of landslides. They are often the primary victims of natural disasters, in part because they are priced out of the more disaster-proof areas and live in crowded, makeshift houses. Earthquakes can cause widespread destruction of infrastructure and other productive capacity and severe loss of life. Floods in urban areas are exacerbated by the filling of wetlands and inadequate waste disposal which clogs drainage systems. Unplanned coastal development can increase the risk of flooding through the removal of mangroves and other natural flood protection mechanisms.

3. *Women and children bear the brunt of urban environmental hazards*

“Women and children are particularly vulnerable to urban environmental hazards.”

Children are particularly vulnerable to environmental hazards due to weaker tolerance to diseases and chemical pollutants. Airborne lead, mainly from automobile exhausts, can affect brain development and lower children’s IQ levels. Women are also more vulnerable than men. They generally have primary responsibility to collect water, wash laundry, cook, and ensure domestic hygiene, so they tend to suffer the most from water pollution, contamination and scarcity. Women bear an additional burden of time in caring for the sick – in some countries, up to a third of their time is spent in this capacity. Women are also more severely affected than men by the range of hazards associated with unsafe and over-crowded housing conditions. For example, women and girls suffer the most exposure to indoor air pollution from smoke or fumes from open fires, or poorly vented stoves that use coal or biomass fuels.

Box 21. Patterns of urbanisation

There are significant differences in the patterns of urbanisation across regions. South America has the highest level of urbanisation, with 78% of the region’s 447 million people living in urban areas in 1995 (United Nations, 1995). In Asia, urbanisation is more recent but has been very rapid in recent years, fuelled by industrialisation, and the urban population is expected to triple over the next decade. Africa, which is generally the least urbanised and where cities are relatively small, currently has the fastest rate of urbanisation. Developing countries already have an urban population more than twice that of Europe, North America and Japan combined. They contain most of the world’s largest cities and, in the more urbanised among them, the urban poor already outnumber the rural poor. National and global figures on poverty often under-estimate the scale of urban poverty because they make no allowance for the higher costs of living in urban areas — for instance, the costs of building or renting housing, getting to and from work and paying for water.

Each urban area has its own particular range of environmental problems. Therefore, each urban centre has to have locally determined environmental policies and priorities. The key factors to differentiating cities are geography and climate. For example:

- Cities with a cooler climate may have in-door heating as their main source of air pollution, whereas cities located in climatically warmer zones are more likely to suffer air pollution from vehicles and industry.
- Cities on relatively flat sites are harder to drain than those on sloping and hilly sites, and in countries subject to periodic heavy rain this can result in flooding becoming a major problem. Cities on sloping terrain, however, are more prone to suffer from landslides.
- Desert cities are more prone to have water supply problems.

C. Urban poverty reduction challenges

Efforts to reduce negative environmental impacts on the urban poor can be grouped in five categories:

- Improving living conditions for slum dwellers.
- Improving water supply and management.
- Managing wastes.
- Controlling industrial pollution and effluents.
- Strategic urban planning (including addressing the hazards associated with natural disasters).

Improved urban governance is a pre-condition to each of these endeavours.

1. *Improving living conditions for slum dwellers*

Many of the most serious diseases in cities in developing countries are transmitted through air, water, soil, and food, as well as through insect or animal vectors. The unsanitary conditions typical of shanty towns also facilitate transmitting air-borne infections, a leading cause of easily prevented death. Within unauthorised settlements, a wide range of environmental hazards can interact and reinforce each other. It is therefore very difficult to separate out the individual health impacts of inadequate water supply and sanitation, garbage accumulation, reliance on open fires or mobile stoves for household uses, inadequate facilities to store food, and overcrowded accommodation made from shoddy and flammable materials. Slums are thus among the most health-threatening of all human environments, with a high incidence of preventable diseases such as intestinal worm diseases, tuberculosis and respiratory infections.

Box 22. Environmental degradation and environmental hazards

It is necessary to distinguish between environmental degradation and environmental hazards. The example of sanitation can show the difference: inadequate provision for safe disposal and removal of human excreta generates very serious health problems and is thus an environmental hazard, but it contributes little to environmental degradation, as excreta is broken down by natural processes. The environmental degradation arises when excreta is inefficiently collected and dumped untreated into water-bodies, where the volume overwhelms the natural capacity of the water bodies to break it down.

There is little evidence that poverty is a significant contributor to environmental degradation in urban areas. But there is strong evidence that environmental hazards are a major contributor to urban poverty.

Environmental degradation (e.g. high use, waste or destruction of non-renewable and renewable resources, generation of bio-degradable and non-bio-degradable wastes) is to a larger extent caused by the consumption patterns of middle and upper income groups, by urban-based production and distribution systems that serve them, and by the failure of government to implement effective environmental policies. The heaviest industrial or individual polluters do not generally suffer the full consequences of their degradation of natural resources, and the distribution of urban environmental costs and benefits is highly unequal. This is another manifestation of an inequitable kind of growth that is to the detriment of both the poor and the environment.

Environmental hazards are here understood as the potential threats to human health from a degraded environment (e.g. waterborne, airborne, food-borne biological pathogens; chemical pollutants from fires, stoves or burning garbage; faecal contamination; deforested slopes with risks of landslides; desertified sites that are regularly flooded). The poorest citizens consume the least water and energy, and generate the least amount of waste as they often reuse or recycle. Yet they bear a disproportionate share of environmental hazards including industrial and transport-related emissions and wastes, and the least sanitary living conditions.

Coping with environmental hazards: exposure and vulnerability

The presence of an environmental hazard does not necessarily mean that it will harm someone. The risk depends on characteristics of the individual, household and social group exposed to the hazard. Apart from the degree of exposure, vulnerability to environmental hazards is influenced by two other factors. The first is the ability to cope with illness or injury (weak body defence, limited mobility, limited financial means), which is heavily influenced by the lack of access to health care and emergency services, individual, household or community coping mechanisms. The second is the scope for taking time off to recover from sickness or injury.

The people most vulnerable to environmental hazards are those least able to avoid them and/or cope with the resulting illness. The poorest fare badly on all three factors – they are the most exposed to hazards (at home and in the work place), have low access to health care (which they often cannot afford), and can least afford to take time off from work. These factors hamper the ability of the poor to invest the additional time and energy to manage resources sustainably and to improve their livelihood. This is particularly important for women as they usually spend more time caring for the sick. They also have less time available to adjust work and to recover from illness, due to their additional household and child care responsibilities. Moreover, they tend to have poorer diet and nutrition as they often eat last and less.

About half the urban population in developing countries is suffering from one or more of the diseases associated with inadequate water supply and sanitation -- diarrhoeal diseases account for most water-related infant and child deaths. The associated costs, ranging from curative healthcare to income

lost to illness or premature death, are a significant burden for the poor who often cannot afford to take time off to recover from illness. Efforts to improve slums include the following components:

- a) Ensure recognition by responsible authorities

“Lack of recognition of informal settlements often results in a policy of neglect by authorities.”

The fact that many informal urban settlements are established spontaneously – often illegally or without formal authority, let alone assistance by responsible urban authorities – is an important constraint to providing basic infrastructure. The absence of any planning also makes it more difficult and expensive to subsequently provide essential infrastructure including roads and drainage, water supply and sanitation.

The lack of recognition of such informal settlements often results in a policy of neglect by governments or municipal authorities. Thus actions which could improve living conditions of the poor are often not taken. Such actions could include guaranteeing access to shelters that are less dangerous, providing access to the resources that would allow poor people to build safe and adequate quality housing themselves, ensuring that all urban dwellers receive some basic level of provision for water, sanitation, drainage and garbage collection, or providing the community based health care and emergency services which can help prevent illness or injury and limit its impact.

The problems posed by unauthorised development must be tackled as early as possible. It is essential to identify and avoid a large number of people settling in dangerous areas, to identify alternative sites, and also to minimise the costs of “retrofitting” infrastructure. The damage or destruction of housing and other assets from, for instance, floods and landslides can be a shock which pushes low income households into absolute poverty. A small investment in facilitating more appropriate settlement patterns can yield considerable savings in the long run. Relatively simple measures such as improved building and settlement planning and siting, along with improved housing design and construction greatly reduce the impact of earthquakes, floods, fires and high winds. Even where disasters have natural triggers that cannot be prevented, their impact can generally be greatly reduced by identifying the most vulnerable groups in the urban area, and acting to reduce this vulnerability before the disaster occurs. For instance, risks from flooding are much reduced for cities with good drainage and garbage collection systems.

- b) Enhance tenure security

“Tenure security helps to improve living conditions for the urban poor.”

One of the most important ways to improve living conditions for the urban poor is to provide secure tenure. Aside from eliminating the threat of eviction, formalising tenure allows residents to capitalise on individual and collective investments, directly contributing to improved environmental management. Evidence from Indonesia has shown that secure tenure increases willingness to subscribe to waste collection services. Secure tenure is generally a precondition for obtaining home improvement loans.

“Attention is needed to tenure rights of women.”

Women are often denied the same access to formal land tenure as men. In many countries, women cannot legally or culturally hold title or inherit land from parents or husbands. Programmes to register land titles often do not provide titles to women, not even for land occupied by female-headed households. Since men tend to hold title to most tangible assets, poor women tend to have little or no collateral with which to secure credit. As a significant portion of poor households are female-headed, these practices exclude many households from the benefits of tenure security. Initiatives to improve tenure must address these inequities.

Granting tenure to unauthorised settlements raises difficult legal issues, and the scope for encouraging corruption and speculative behaviour must be recognised. Resolving disputes between illegal squatters and lawful owners often requires lengthy negotiations and litigation. Where shantytowns are established in hazardous areas, there may be no alternative to resettlement.

c) Improve housing

When ‘minimum standard’ accommodation is too costly for a household, certain sacrifices have to be made for the accommodation to bring down the price. Such sacrifices will often be in environmental quality: for example squatting on marginal lands without piped water or sewage systems. Although this means health risks and inconvenience, these are often seen as less important for the household’s survival than other items (for example expenditure on food or clothing or investments in a second-hand machine to allow a member of the family to earn income).

Housing is often viewed as consumption rather than productive infrastructure. Development agencies increasingly recognise, however, that improved housing can boost income generation and productivity, apart from improving health, especially when the house is used for income-generating activities. This is particularly relevant for women who cannot seek employment outside the home for cultural or religious reasons. Investment in housing, which is very labour intensive, also stimulates employment at the local level.

In the past, many governments attempted to resolve urban housing shortages by directly providing housing, normally subsidised to make it more affordable to the poor. This proved both financially unsustainable and ineffective. Much publicly provided housing proved too expensive or otherwise ill-suited for the poor (due to location far from centres of employment). It has more often benefited relatively high-income groups. The failure of publicly-provided housing to address the need of the poor meant that migrants and sections of the urban poor had little alternative but to construct their own houses on squatted land.

“The focus of government housing policies for the poor should be on supporting self-help efforts.”

The focus of government housing policies for the poor should emphasise supporting self-help efforts, including by providing micro finance (or establishing community-level credit schemes) and giving technical advice for housing construction and improvements. Examples include promotion of cleaner household fuels and stoves to reduce respiratory and other health problems, and improvement of public transport which can reduce the disadvantages of living in peripheral locations and help keep down house prices. These efforts have their limits and need to be supplemented by macro-level reforms to improve financial markets and slum dwellers’ access to formal sources of funds.

These efforts need to take special account of the difficulties women face in obtaining credit for home improvement and access to land on which to build. Higher illiteracy rates among women make it more difficult for them to obtain information about credit. Poor women also have far less spare time than poor men to obtain credit in most countries.

d) Improve access to basic services in slum areas

Slum-dwellers often have to purchase water from vendors at several times the price per litre of piped water. Alternatively, they often must boil their water to eliminate risks of diseases. This creates higher direct fuel costs for the poor and greater air pollution, and it fails to eliminate the risk of contamination from heavy metals, other inorganic pollutants, and many industrial organic pollutants. In some countries, the resulting demand for fuel wood contributes significantly to forest depletion and watershed degradation in surrounding areas.

“Most poor households are willing to contribute towards the provision of water supply infrastructure to community level.”

Many poor households would be able and willing to pay the full costs of water supply infrastructure and services at least at the community level, if not at the household level, and most poor households would be willing to at least contribute in cash or kind to enable the provision of water supply infrastructure to the community level. However, local authority’s unwillingness to recognise the housing rights or land tenure of the urban poor limits their access to adequate water and sanitation services in many cities. The type of service provided must reflect the ability of users to fund the maintenance of the infrastructure, either through labour or fees. This implies making maximum use of low-cost options, which includes involving communities to provide part of the services. For example, an agency may provide piped water, sewer, or drain connections to a communal site, and the community would be responsible for distribution and fee collection. In other cases, low-income communities may prefer and be able to pay operation and maintenance costs, but may require assistance to fund the initial infrastructure investment. Tariff structures with a low price per unit volume of water up to a certain consumption level also help ensure that even the poorest can afford water while discouraging waste. It may be necessary to support or establish community organisations in order to implement these low-cost options that require community involvement.

“Water supply and sanitation improvements must go hand in hand.”

Water supply and sanitation must also go hand in hand. This is because improved sanitation is needed to reduce diarrhoeal and other water-borne diseases. Household’s wastewater provides a breeding ground for disease-carrying insects and can facilitate developing soil-based parasitic worms. As in the case of water supply, all cost-minimisation options, including sewer-less systems, should be considered to address urgent demands. However, the demands of households and communities change over time. Growing households, for example, use more water and create more waste. Under-designed drainage or sewerage systems, particularly if not well maintained, can quickly become inadequate to the task and breakdown, increasing the public health risk they were intended to resolve. There is therefore a strong case for public funding to reduce the negative externalities associated with inadequate sanitation systems and to enable economies of scale in infrastructure provision to be realised. However, any developments should be implemented in conjunction with local communities and should include mobilisation of community financial and other resources.

“Communities should be involved at all stages of infrastructure improvement.”

An important determinant of success is to involve the community at all stages from the selection of the most appropriate options and design of the system, to the construction and maintenance of the infrastructure. Because of women’s role in providing and using water in the household, and for household sanitation, it is critical to involve women in this planning process – programmes which do not are generally much less successful than ones that do. This may require explicit effort to obtain women’s input. Government agencies involved in these programmes may need assistance to understand the value of women’s input, and to ensure that women are involved. Assistance can also be provided to enable community-based organisations to play a part in the provision of essential water supply and sanitation services at the community level.

In most countries, initiatives to improve access to water for low-income groups are contingent on wider efforts to improve the performance of water utilities at the city-wide level. These issues are addressed in Section B below. Institutional and technical options to minimise the cost of water supply and sanitation for poor households, subject to an assessment of longer-term demands, are outlined in Annex 3.A.

In addition to the health benefits, access to piped water can bring considerable financial and time savings as well as reduced physical effort for those who have to carry water over long distances. In some urban areas, these benefits accrue mainly to women and girls, who have primary responsibility for managing households. For some women, the time savings alone can significantly increase the scope for pursuing alternative income-generating occupations. Also, since women tend to bear more of the health and time costs from unclean water and sanitation services, they tend to be willing to pay more for clean services.

e) Improve access to health care

While it does not in itself prevent or reduce exposure to pollution or pathogens, providing primary health care greatly reduces the health impact of these environmental hazards. It plays an essential role in helping affected people cope with the hazards they are exposed to. Immunisation campaigns also play an important role.

f) Support awareness raising and education

There is a need to raise awareness of poor households on health gains from improved hygiene practices.”

Improving sanitary conditions in slum areas requires raising people’s awareness of the various factors influencing the quality of the environment and the impact of individual behaviour. With lower education levels than other social groups, slum dwellers in many areas are unaware of basic health and hygiene practices. The health gains of improved access to water and sanitation are multiplied when accompanied by improved hygiene practices. Awareness-raising efforts are particularly critical among communities with limited tradition of urbanisation. For example, rural immigrants, whose experience of waste management is to dispose of it locally, often do not understand the consequences of these actions in highly populated areas. Similarly, the success of programmes such as city-wide immunisation initiatives, or campaigns against malaria that encourage eliminating stagnant puddles of water, hinges on the participation of all individuals. These efforts require that participants clearly understand the stakes involved.

In providing information to communities, programmes will be much more effective if they recognise that men and women obtain their information from different sources, and need different information. For example, men and women tend to listen to different radio shows at different times of the day. Where illiteracy rates are higher for women, women use printed material less than men do. Women are often responsible for teaching children about hygiene, so efforts to disseminate information about hygiene practices for children will be more successful if the information is targeted to women. Similarly, women tend to be responsible for handling water in the house, and will use information on that topic more than men will. But men tend to handle toxic materials such as paint, oil, and solvents more than women do. Thus, efforts to keep these toxic materials out of sewage systems will need to target men.

2. *Improving city-wide water supply and management*

In many countries, urban water and sewerage systems are managed by municipal or district water companies owned by local authorities. Water is provided at prices well below long-run financial and environmental costs, resulting in overuse and waste. High levels of uncollected accounts and system losses accentuate this. Combined with poor management practices, these effects severely undermine the ability of public water utilities to maintain, let alone expand or upgrade, their network. Water services are thus often confined to relatively high-income groups.

“Many cities urgently need to reform policies and institutions for water supply and management.”

Many cities urgently need to comprehensively reform policies and institutions to stop the rapid deterioration of water infrastructure, to promote efficient and sustainable use of water, and to generate revenues for needed investments. This will allow water suppliers to expand service areas to less privileged communities. It generally requires increased cost-recovery, improved resource conservation and fostering pollution prevention at the source. It implies mobilising private capital and management expertise to finance and operate water supply infrastructure.

“Commercialising or privatising water supply services can work well if properly regulated.”

Provided that local governments appropriately ensure public accountability and protection against abuse of a monopoly position, commercialising or privatising water supply services can work well. At the same time, liberalising markets without appropriate and effective regulatory systems can lead to major problems. Of special concern is the tendency for privatised service providers to focus on the richer areas best able to afford their services, while neglecting lower-income areas. Also, while water systems need to cover their full costs (at least for operation, maintenance and further investment) through pricing, it may be necessary to provide financial assistance to the poor to ensure they can afford adequate amounts of water.

“Shifts toward full cost recovery should not penalise the poor.”

Regulatory controls are critical to ensure that public or private utilities perform properly. These controls must address who gets access to services and under what conditions. Regulatory authorities must also ensure that shifts towards full cost recovery do not unduly penalise the poor. They should encourage the introduction of systems that link charges accurately to the levels of service or pollution, and setting appropriate minimum standards of service. Technical support could be given

to regulatory authorities to ensure that appropriate systems and contracts are drawn up which reflect these aims.

For the authorities responsible, improving the management of water utilities involves a shift from directly providing water infrastructure and services towards regulating services provided by private or public utilities. Priority policy issues to be addressed in reforming water utilities are outlined in Annex 3.B.

3. *Managing wastes*

Many cities lack effective systems to collect, treat and dispose of solid wastes safely, with low-income districts having the least adequate collection service. Waste is left to accumulate and decompose in open spaces and streets, attracting disease vectors and pests, clogging drains, giving off noxious dust and odours, and creating major health hazards. Uncollected waste generally ends up washed into water bodies. Waste that is collected is often deposited in informal dumps, which contaminate ground and surface water, proliferate insect and rodent problems, and can contribute to air pollution from uncontrolled burning.

At the same time, collecting, sorting, and recovering waste is an important and labour-intensive informal industry in many developing countries. Materials recovered from waste also serve as raw material for a wide range of products. Waste pickers (often children) are generally found among the most socially and economically marginalised groups and endure the most unsanitary working conditions. Their work is hindered by poor collection cycle carts, limited storage space (many collectors live in cramped or rented accommodation), irregular collection routes, and irregular sources of waste material.

“Efficient municipal waste collection and disposal systems are essential to urban environmental management. Informal waste collectors should become part of this system.”

Efficient municipal collection and disposal systems are essential components to urban environmental management, whether they are in the private or public sector. Developing formal waste management systems that build on the skills and knowledge of informal waste collectors can have important economic, social and environmental benefits. It can help increase the recovery and recycling of valuable resources found in urban waste streams, reduce residual waste volumes to be disposed of, and improve working conditions and incomes for informal waste pickers. This requires paying specific attention to the needs and constraints of informal male and female waste pickers who are often left out of decision-making processes. Instead, decisions concerning waste management generally focus on the priorities of middle and upper income groups who generate the largest volumes of wastes. However, increased use of informal waste pickers must at the same time reduce their exposure to the handling of hazardous wastes, for which specific urban environmental management plans and policy measures are required.

Many developing country towns model their waste management systems on those of developed countries, resulting in socio-economically inappropriate technology choices. Examples include waste collection vehicles that cannot cope with narrow or unpaved roads and lanes, or composting or incineration plants that are unsuited to the volume and composition of waste streams. Similarly, compacting waste reduces the possibilities to reclaim and recycle material, unless re-usable or recyclable material is specifically separated before waste is collected.

Box 23. The urban waste management economy

Sorting wastes to maximise re-use, repair and recycling potential is a potentially labour intensive process and the livelihoods of large numbers of people in many developing world cities depend on such occupations. The degree of formalisation into the economy varies from informal sector waste scavengers to local government and NGO initiatives to support workers in collecting, sorting, selling and composting municipal wastes.

Sorting and recycling of waste can create considerable numbers of jobs, and the informal sector generally employs more people in these activities than the formal sector does. These activities can also help reduce the demand for energy, imported raw materials and foreign exchange. As cities become more prosperous, people tend to dispose of more potentially recyclable waste per capita. This creates greater possibilities for introducing initiatives to improve productivity and working standards in the waste collection industry. Programmes can aim to include local networks of collectors with organised storage facilities, fixed routes and collection hours to allow collectors to offer the reliable service needed by large waste producers. Projects can help to establish fixed contracts with industries for collectors which offer more reliable sources of income and better working conditions.

4. Controlling industrial pollution and effluents

“The scale of hazards linked to industrial pollution increases rapidly with urbanisation.”

The scale and severity of hazards related to industrial pollution generally increases rapidly with urbanisation. A wide range of chemical pollutants common in urban areas, ranging from sulphur dioxide from coal burning to lead and suspended micro-particles from industrial transport-related sources, affect human health.

Businesses generally have incentives to violate existing regulations concerning pollution and waste disposal and face little risk in doing so. Thus, careless disposal of waste, including hazardous materials such as solvents, heavy-metal compounds, or infected hospital wastes has resulted in many deaths and serious injuries. The chemical, leather tanning, pulp and paper, electrical equipment and metal industries all generate considerable volumes of hazardous wastes.

The success of initiatives to enhance waste management practices of industry depends critically on the availability of efficient waste collection and disposal services. Controlling the effluents from small-scale, informal enterprises that operate at the household level and release their highly-polluting waste streams without any treatment is particularly challenging.

“Controlling industrial pollution requires effective regulation.”

Controlling industrial pollution and managing the safe disposal of solid and liquid wastes generally requires regulation backed by an ability to monitor compliance and to punish violators. Strong public support of efforts to address industrial pollution is important to overcome the common resistance of industry to change. Broad public awareness of the health hazards from pollution and of the role industries have in tackling this challenge is a critical first step. Public pressure invariably plays a key role in building the necessary political will to enact and enforce pollution regulation.

“Market-based instruments can reinforce regulation.”

Market-based instruments can further reinforce planning and regulatory mechanisms by sending appropriate market signals to consumers, firms and governments. The range of approaches is considerable and includes pollution charges, user-charges, licence fees, deposit refund systems, and environmental taxes or subsidies.

Local and national authorities can foster efforts to increase the incentives for pollution and waste reduction at source by encouraging investment in cleaner production methods as well as resource re-use, recovery and recycling. Donors, industries, and developing country governments can work together to transfer the technology needed to make clean production processes widely available.

Both market-based incentives and command-and-control regulations are likely to be needed to decrease industrial pollution, and both rely on monitoring and the assumption that a polluter who exceeds a present discharge level will be subject to sanctions of some kind. Both approaches require government enforcement to be effective. Enforcement will only work if regulators can identify violators and if sanctions against violators are upheld by the judicial system. Thus regulatory agencies may need assistance to build the capacity to monitor industry and to impose sanctions. Lawyers and judges may also need assistance to understand how to support new regulations and to uphold appropriate sanctions.

Box 24. Incentives for pollution reduction

Cost reduction: More efficient processes coupled with improved material handling and savings on inputs through reduced use can significantly lower costs of production.

Access to markets: Firms using cleaner production techniques often enjoy significant marketing advantage in foreign markets.

Goodwill: A poor public image can reduce sales in local markets.

Access to finance: Firms vulnerable to legal action in response to violation of regulation often face discrimination in access to finance.

Exposure to litigation: The ability of citizens to litigate to recover damages from pollution can be a significant financial and public-relations incentive for firms to avoid causing those damages.

5. ***Strategic urban planning***

“Strategic urban planning can provide environmental benefits for all urban dwellers including the poor.”

While not directly targeted at the poor, efforts to improve the general functioning of cities have important benefits for the poorest who bear the brunt of urban ills. In the absence of any plan or effective control over new developments, cities generally expand haphazardly, with residential, industrial and other development spilling out in the periphery, often in a quite random manner. The result is a patchwork of different developments and residential settlements interspersed with vacant land, often used as waste dumps. Poor households are confined to the poorest and lowest value locations, often far from centres of activity, or beside industrial developments where environmental health hazards are greatest. Often the poor must spend considerable time and money going from the places they live to where they work. Where they cannot afford the time and cost, they often have to

live in illegal and hazardous places close to the work site. Taking account of where poor women and men work and, consequently, their housing needs, through participatory planning and urban governance and zoning regulations, can help alleviate poverty.

Strategic urban planning integrates land use controls with the planned development of transportation and other infrastructure. This approach can provide important environmental benefits through reduced congestion and pollution. It can help reduce the cost of providing public infrastructure by reducing the length of roads, gas and water pipes, electricity lines, etc. It can reduce the need for transport services while making it possible to establish viable and efficient public transportation services. By reserving areas for low-income housing development, mixed-use urban planning can help avoid confining low income groups to the urban periphery. This facilitates better access for low-income groups to sources of livelihood while limiting the use of private motor vehicles. Encouraging a greater mix of residential development, employment, leisure, health care and education can also improve people's access to employment and services, while avoiding the marginalisation of poor women and men.

Strategic urban planning is critical to address the challenges posed by informal peri-urban settlements. City managers must be able to respond rapidly to avoid large numbers of people settling in dangerous areas and to identify alternative sites for these poor people to settle. This will help minimise the cost of retrofitting infrastructure in peri-urban areas. A small initial investment in facilitating more appropriate settlement patterns can yield considerable savings in the long run.

Disaster mitigation and preparedness can lessen the disruption caused by natural hazards, save lives and protect property, especially in urban areas. Investing in prevention pays off: for example, a cost-benefit analysis for eight cities in the Argentina Flood Rehabilitation Project yielded a high rate of return.²⁰ In low-income urban areas, resettlement is often the appropriate risk prevention strategy in flood-prone or volcanic areas. These actions can be addressed in the context of the development of strategic urban planning.

“Citizens should be involved in the strategic planning process.”

To ensure that plans have broad support and are therefore most likely to be implemented, it is necessary to involve citizens in the planning process. A truly participatory process must involve the women and men that will be affected by those plans at all stages, from defining the problems, to choosing solutions and determining how to implement them. Throughout this process, extra effort may be needed to include marginalised groups, particularly women.

Strategic planning entails blending predicting development needs, collecting and disseminating information, and facilitating and negotiating among conflicting needs and interests. Overly prescriptive approaches have often proved infeasible. Relevant measures that may be more effective are listed below:

- **Integrated transport planning and management** addresses such issues as congestion, air borne pollution and traffic accidents. This generally requires cross-sectoral approaches, such as linking transport and land use planning. Many opportunities exist to mobilise private sector investment to provide infrastructure as well as public transport.

20 . According to the Provention Consortium (www.proventionconsortium.org), the estimated rate of return was at 30%.

- **Restricting certain activities or industries to specified parts of the city (zoning)** and away from vulnerable resources, such as waterways, can promote energy efficiency and facilitate pollution control and waste management. This can include establishing industrial parks equipped with specialised waste treatment facilities. There may be limited options to relocate small or micro-enterprises or household-based workshops that are fully integrated in residential areas, even where these enterprises cause a large share of local pollution. In these cases, zoning may be neither effective nor desirable, and other approaches must be considered. This could combine improved regulation and enhanced monitoring and assistance for cleaner production. Assistance for cleaner production methods could also be considered.
- **Strategic use of green space** can keep development away from high-risk areas such as unstable hill slopes or vulnerable flood plains; and providing buffer zones between roads and residential areas reduces noise. Plants and trees can also significantly neutralise air, water and land pollution and reduce urban temperatures. Urban agriculture and forestry - in farms, marginal areas, allotments or back gardens - can provide sources of livelihoods for low income groups and help re-use organic household wastes. Agriculture and horticulture in urban areas can combine many environmental benefits while also increasing food production, strengthening livelihoods for low income groups, re-using wastes and reducing energy use. Whether in farms, marginal areas, allotments or back gardens, urban agriculture merits close attention as an integrated approach towards reducing urban poverty and improving the environment. However, in some cities, soil contamination from air pollution and other sources may make urban produce too toxic for consumption. In these cases, urban agriculture may need to focus on non-consumables such as cut flowers and decorative plants. Proper management of livestock and other agricultural activities is also needed to make urban agriculture sustainable.
- **Incorporating city planning and integrated water resource management** would ensure that cities have adequate access to water resources and to limit the impact of cities on downstream users and ecosystems.

Strategic urban planning must be **complemented by broader policy measures** to encourage energy efficiency, discourage the use of private vehicles, and discourage heavily polluting industries from establishing themselves in urban areas. Relevant measures include: reforming subsidies for heating or transport fuel (e.g. to introduce tax differentials between leaded and unleaded fuel for cars) and inputs to polluting industries; road pricing; tax incentives for industries to relocate; subsidised public transportation; effective zoning enforcement; and many others. Some of these measures are beyond the scope of urban authorities and must involve national level economic planning authorities.

The success of city-wide efforts towards environmental improvements often hinges on **active participation at the community-level**. Even the best planned technical solutions can be rendered ineffective or unsustainable by lack of community support or access to women and men's insight about their living conditions. For example, initiatives to improve drainage, by preventing the clogging of drains by domestic solid wastes, crucially depends on individual efforts to change waste disposal practices. This requires that all relevant actors understand the objectives and stakes of the environmental improvement programmes and participate in designing them. Because men and women tend to have such different priorities, urban planning programmes will be far more successful if they explicitly seek to involve both men and women.

Box 25. Involving women in decision-making

Women are perhaps the largest group that is typically excluded from deciding how to use resources. Some programmes try to involve women by simply ensuring that they are on the decision-making committees. This may not succeed in actually getting user committees to incorporate women's needs as well as men's. Common reasons are:

- Women are often socialised to not speak out in groups of men, so women committee members don't talk in the meetings.
- When they do speak out, they often talk about what their husbands want.
- Male committee members ignore women members.
- Committee meetings are held at a time or place that prohibits women from attending.

Where these constraints exist, each programme will need to overcome them in a way that is appropriate for that culture. One model is the approach that an NGO uses with conservative Muslim and Christian villages in Lebanon. The NGO states up front that they will work only with village committees which have at least 30% women. The NGO then works with the women committee members to help them articulate their concerns and how to present them in the meetings. The NGO ensures that the committee meetings are held at a time when women are not expected to be cooking or caring for children or their spouses, and also ensures the meetings are held in a place that is socially acceptable and safe for women to attend. The NGO contacts the women committee members before the meetings to encourage them to attend.

During the meeting, if the women do not speak, the NGO facilitator explicitly asks for their input and ensures that the men either address the women's concerns or explain why they should not do so. This step is particularly important to ensure that the final decisions will reflect both men's and women's concerns.

Involving women is not the only prerequisite for mainstreaming of gender issues. The education of men about the need for and advantages of gender equality must be encouraged and facilitated.

D. Key elements of urban governance

“Most aspects of urban environmental management involve a multi-disciplinary and multi-sectoral approach.”

Most aspects of urban environmental management involve a multi-disciplinary and multi-sector approach, combining spatial planning, regulation and enforcement, improved infrastructure, fiscal measures (e.g. pricing and taxation), and awareness-raising. Decisions regarding planning, land use or investment in urban infrastructure must respond to citizens' demands and give adequate attention to the needs and priorities of marginalised groups, and notably to women and children whose particular needs are often ignored.

Many urban environmental problems can be traced to sectoral policies at the national or regional level. For example, the removal of subsidies to energy or highly polluting fuels can greatly enhance cities' efforts to reduce pollution. The effectiveness of local or municipal-level initiatives thus hinges on appropriate legislative and regulatory frameworks and environmental policies at higher levels of government, as well as on a willingness to devolve power to the lowest appropriate tier of government. It implies a willingness on the part of all levels of governments to engage outside actors, notably communities and the private sector, in decision-making processes and to facilitate self-help

initiatives. This requires that local authorities be accountable, representative and professional, and that they have adequate resources. Successful environmental policies generally demand collaboration between agencies and ministries in a wide range of sectors, to ensure that complementarities between environmental, social and economic goals get recognised and exploited, with potential conflicts minimised. Agenda 21, the Habitat Agenda and *Shaping the 21st Century* each recognise the need for cross-sectoral approaches. National strategies for sustainable development should provide a framework for these requirements for inter-sectoral collaboration, development of effective approaches and policies at different levels, involvements of multiple stakeholders, and recognition of multiple goals.

Political changes have made many recent initiatives in urban environmental management possible by including decentralisation and democratisation. These developments redefine the role of local and national governments. They are less involved in providing infrastructure and services that the private sector tends to provide at lower cost. Instead, they emphasise planning long-term urban development, enforcing pollution control and other regulations that protect social well-being, and creating suitable conditions for private and self-help initiatives. Such national frameworks must also encourage environmental policies which not only address environmental health problems within urban areas but also limit the transfer of environmental costs to people and ecosystems beyond the urban boundaries. Urban-rural interactions in terms of urban demand for rural environmental resources need particular attention.

“Efforts to improve urban governance focus on five areas.”

Efforts to improve urban governance focus on five areas:

- **Improving the effectiveness of state institutions** to fulfil their responsibilities efficiently and with due regard to the needs and constraints of the poorest. Openness and transparency are central to ensuring public support and a sense of legitimacy for the planning system.
- **Recognising when the State lacks the expertise or resources** to address environmental problems, and the corresponding need therefore to collaborate with others in the community and the private sector.
- **Defining the respective roles and responsibilities** of public authorities and private and non-governmental actors in planning urban development, in providing infrastructure and services, and in regulating economic activities. Private sector and community investment and initiatives require a sound regulatory environment.
- **Seeking the right balance of power and responsibilities** between national, regional and municipal authorities. Effective local authorities require supportive national-level environmental legislation and institutions.
- **Ensuring access to information.** Urban planning and development authorities often focus on the needs of the better-off citizens. Poorer communities lack the necessary knowledge to assess the consequences of planning or policy decisions taken by urban authorities, and to formulate alternatives that would meet their needs better. Access to information is critical to influence the decision-making by the state and the private sector.

III. TACKLING POVERTY-ENVIRONMENT-GENDER LINKAGES: BASIC PRINCIPLES AND STRATEGIES

Strategies to address poverty and environmental degradation depend on location-specific environmental and social factors and the possibilities for strengthening state and civil society institutions. The following principles and approaches are general in nature and relevant for both rural and urban contexts.²¹

A. A prerequisite: political will

“Attacking poverty while enhancing the environment requires political will. This usually requires some redistribution of resources to the poor.”

Attacking poverty while enhancing the environment requires first and foremost the political will to eradicate poverty. In most cases, this will ultimately require some redistribution of resources - or rights of access to resources - toward poorer sectors of society. The search for win-win situations should not divert the state from also reallocating resources towards the poor. The political will of the state in championing the cause of the poor is tested through its commitment to uphold and enhance rights regimes for the poor. Community-based decision-making and transparent dialogue cannot occur without political will at the highest level.

B. Key policy priorities

1. *Protect and develop the asset base of the poor*

“The asset base of the poor must be protected...”

While all rights regimes involve some regulatory and supervisory role for the state, in some cases the rights regime may already be relatively favourable for management by the poor, but they are not able to protect their rights. Poor people need to be protected from or empowered to fight against actors who encroach upon their resources. For example, coastal fisher-folk may have the right to fish in certain waters, but they may be powerless against trawlers that sweep through their fishing grounds. People dependent on the forest may have no recourse against logging taking place in upper watersheds, yet they bear the consequences in the form of floods, drought, and soil erosion. Protecting the asset base requires a wide range of actions, including support to strengthening community-based organisations which genuinely represent poor people, and actions in the regulatory and governance areas which strengthen the legal basis of poor people’s rights. Civil society organisations can often play a role in supporting communities in asserting their rights over resources.

“...and developed.”

Beyond protection of resources, there is a need for support to develop the asset base of the poor, including the environmental resources which poor people are heavily dependent on. The protection of resources may not be enough to ensure that resource users can enhance their livelihood

21 . For a more extensive treatment of these issues, see e.g. UNDP-EC (1999b)

options, especially where population growth is increasing pressure on the resources. There is a need for technical and institutional innovations which support communities in augmenting the resource base (e.g. grazing land enrichment, fisheries management measures which enhance fish stocks, joint forest management, etc.), and/or in finding substitutes which reduce the pressure on resources (e.g. alternative fuel sources, expansion of off-farm income-earning opportunities etc.).

2. *Prioritise investments in fragile and marginal areas*

“Investments in fragile and marginal areas should be prioritised.”

While the record of development efforts to improve conditions in risk-prone regions or in spatial poverty traps is mixed, this has in part been due to a lack of commitment to such areas on the part of governments and donors. Investment in such areas is fundamental to poverty reduction. Reinvesting in neglected areas requires a change in government and donor policies to support the attainment of sustainable livelihoods for the people living in those areas (i.e. a majority of the rural population). This will have further positive effects in terms of reduced natural resource degradation, reduced rural-urban migration, and additions to national product. Accomplishing this requires improved access to productive assets by the poor, as well as institutional changes that reverse the bias of governmental institutions against small producers and indigenous populations. Reversal of such biases will assist the recognition that marginal areas nonetheless have potential, including in the production and marketing of “non-traditional” products such as high-value biodiversity products.

In addition, given the magnitude of land degradation and the scarcity of productive land in many marginal areas, basic development of social (education and health systems) and physical infrastructure, and of other activities that foster the creation of off-farm productive employment and income opportunities for the rural poor, is crucial. Access to credit, market advice and technical support, can facilitate the development of such activities.

3. *Support off-farm rural livelihood diversification*

“Expanding the scope for off-farm income generating activities helps to relieve resource pressures.”

The livelihood options available to poor women and men in rural areas include, but are not restricted to, the use of natural resources. Poor households engage in a wide range of other small-scale or micro-enterprises, for example to meet local demand for semi-processed food products, household goods, farm implements, and services. For most households these activities are additional to on-farm production but may in fact be the main source of cash income. As pressure on natural resources increases, the significance of off-farm activities also increases, and expanding the scope for such activities will help to relieve resource pressures.

Policy measures therefore need to address factors which may restrict the growth of rural enterprises, including lack of roads and other basic infrastructure, limited access to credit, etc. Improving education and physical infrastructure may have greater impact on expanding income opportunities for the landless poor than investments aimed at enhancing on-farm production. Nonetheless neither should be supported at the expense of the other since both are clearly required. Any measures aimed at stimulating development of off-farm enterprises should pay specific attention to the needs of poor women, who in many areas have shown their ability to develop successful micro-enterprises whilst maintaining loan repayment rates higher than those of men.

C. Key approaches

“The poor need to be empowered, engaged as partners, and provided with appropriate incentives which have positive poverty-environment outcomes.”

Building partnerships with local communities is a new endeavour for many agencies. It requires not only good will, but also a commitment to experimentation and fine-tuning solutions. Key approaches include:

- Empowering poor people as actors in identifying their problems and seeking their own solutions, and not assuming the poor are the problem.
- Engaging poor people as partners, not as beneficiaries, and using people-centred frameworks for planning and implementation.
- Creating incentives for poor people as well as for private sector entrepreneurs to mobilise resources for poverty eradication, and moving away from just exhorting the poor to mobilise their resources or from providing all the resources from state budgets. The government’s main role is to create enabling situations, provide matching funds or other incentives to catalyse co-funding from the poor.
- Facilitating the formation of community-based organisations, and moving away from creating further governmental institutions. New forms of people-managed organisations include water user groups, forest protection committees, slum-dwellers associations, etc. The government’s role is to provide a flexible enough legal platform to stimulate the emergence of these institutions, and sufficient patience to work through their gradual development. NGOs and similar civil society organisations can play a key role in supporting the development of such organisations.
- Giving poor people real rights and ownership, not just “sense of ownership”. Transferring greater responsibilities to people can only succeed if it is balanced by greater rights. Often, this involves legal change, as well as new operational guidelines. Gender dimensions of ownership and other rights are fundamental.

D. Operational shifts

“Governments need to make operational shifts towards genuine partnerships with the poor. Government officials may need training in gender analysis and participatory planning.”

Moving toward partnerships with poor people also requires many operational changes in the way governments work with people. Government officials may need to have training in gender analysis and participatory planning techniques. Government agencies may also need to hire more female employees so that they can better include women in the planning process. Internal incentive structures may need to be modified so that working with people becomes part of the government employee’s performance evaluation. Regulations may need to be modified so that agencies can give financial support to NGOs and civil society groups, not as contractors, but as partners in community-based environment-poverty efforts. Mechanisms need to be developed to ensure feed-back of learning from local level to national policy level. Efforts to operationalise poverty reduction-environmental improvement strategies should consider the following principles:

1. Work across sectors

“Cross-sectoral policy-making is essential for an effective livelihoods approach to work.”

People do not live in “sectors.” The poor rely on access to and control over a diverse set of resources for their livelihood. Governments may divide themselves into Departments of Agriculture, Water Resources, Forestry, Fisheries, Municipal Water Supply, etc., which are rarely organised to facilitate inter-sectoral solutions. However, poor people’s survival strategies are integrated, that is, they use a combination of resources and make calculations across different sets of resources when planning their investments and extractions. Furthermore, the poorer the people, the more likely they are to derive their livelihoods from a diverse set of activities, and to rely on a diverse set of natural resources.

While policy and decision-making bodies are usually organised by sector, cross-sectoral policy-making is necessary to ensure that “solutions” in one sector do not create problems for another sector. A livelihoods approach helps to make the trade-offs between economic growth, human development, social integration and environmental integrity explicit. This understanding can facilitate the development of management practices that provide the best solution to the dual objectives of sustainable resource management and poverty alleviation, that are acceptable to the involved stakeholders. The adoption of a livelihoods approach in traditionally sectoral bureaucracies will not happen automatically, but can be encouraged and facilitated through dialogues of the type required to implement successful processes of sustainable development at national and lower levels.

2. Decentralise to the lowest appropriate level and develop pluralistic partnership approaches

“Decentralised planning supports holistic approaches and facilitates participation.”

Decentralised planning is desirable for a number of reasons. It helps local actors to produce a vision that is ecosystem oriented, and not just sector specific, and facilitates participation. It also maximises resource mobilisation while ensuring that resource allocation decisions are responsive to the needs of communities and households. Decentralisation places accountability and responsibility at appropriate levels, and allows quick action following monitoring and problem solving. Effective decentralisation however requires both devolution of authority and considerable capacity building at the lower levels, otherwise there may simply be a hiatus in decision-making which provides opportunities to wealthier groups and individuals to gain control of resources and use them unsustainably.

In addition, it cannot be presumed that decentralisation is automatically beneficial for all groups. Communities cannot be seen as homogenous and non-hierarchical. For example, marginalised groups such as poor families and different ethnic groups may be excluded even in decentralised processes. Experience also shows that women have less access than men to decision-making. An understanding of norms, values, attitudes, rules and regulations underlying decentralised decision-making at community level is necessary to ensure that vulnerable groups are not further marginalised.

“Pluralistic approaches to decision-making are needed to address issues of multiple resource users.”

The concept of pluralism recognises the existence of differing and often conflicting positions. Pluralistic approaches to decision making can accommodate different interests and the

increased likelihood of conflict that this is likely to bring. This is particularly relevant in connection with multiple users of a resource where the objectives of one user group can have negative impacts on other groups. Drawing on the skills and resources of the private sector may be beneficial in this regard. Legal and regulatory frameworks, for example those addressing rights to land and other natural resources (forests, fisheries resources etc.) need to be designed to accommodate the potential for multiple users to co-exist.

3. *Pay close attention to macro-level policy coherence*

“Macro-level policy coherence is essential.”

At the macro-level, governments have important policy-making and planning responsibilities and inter-sectoral co-ordination is required at the ministry level. Providing access to government at high levels by people’s organisations or other elements of civil society can help make sure that inter-sectoral concerns stay on the agenda, and that the integrated perspectives of the poor, in particular, are voiced.

4. *Understand gender relations*

“Gender analysis is necessary for effective poverty eradication and environmental sustainability.”

Effective implementation of poverty eradication programmes requires that gender analysis be applied to working out rights and responsibilities of women and men, both between and within households. Strategies have conventionally downplayed the management contributions of women, as well as the need to include women in policy and political discussions on resource management. This has in part resulted from stereotyped views of the roles of rural women which have restricted the scope of gender-related development interventions.

5. *Focus on the needs of children*

“Children are particularly vulnerable to the effects of environmental damage. Special care must be taken to ensure that children benefit as much as adults from any intervention.”

Children, even more than their parents, are at risk from pollutants in the environment, or from the effects of environmental damage that leads to impoverishment and malnutrition. Poverty compounds these effects on children, because it is often associated with inadequate housing, poor access to basic services, indoor and outdoor pollution, and lack of space in which to live. Efforts to improve the environment that allow families to take better care of their children can have tremendous impact. For environment and poverty objectives to be met, special care must be taken to ensure that children benefit as much as adults do. An improved understanding of intra-household issues needs to include a focus on children’s welfare.

Box 26. Monitoring performance

Performance indicators are required to indicate whether the goals of reducing poverty and enhancing the environment have been achieved. Accountability systems are needed at a national and international level to assess impacts of macro actions on the poor and on their resources. In developing performance indicators it is critical to address both poverty and environment questions.

The key questions for the *environment* relate to whether the new arrangements are less stressful than the current methods, if continued, would have been. In other words, does the innovation bring about environmental sustainability?

For the *poor men and women* involved, the key questions concern equity. Do the poor benefit from the new arrangements? Do poor women and men benefit equally from the innovation? And do children benefit?

E. The role of donor co-operation

Priorities for donor support for actions which reduce poverty and enhance the environment will tend to be location-specific. However, a hierarchy of support can be identified, addressing local, national and international issues. Local issues have to do with the wide variety of interventions required to encourage and support sustainable management of environmental resources. National issues can be in the areas of, for example, policy development on tenure security or on support to pro-poor agricultural research. International issues relate, for example, to implementation of the Global Conventions, particularly on Desertification and Biodiversity. There are clear linkages between these levels, which calls for donor coherence in developing poverty-environment interventions.

F. Capacity Development

“A key prerequisite for effective actions addressing poverty-environment issues is capacity development at different levels.”

A key prerequisite for effective actions addressing the poverty-environment nexus is capacity development at different levels. The Summary Table and Table 1 indicate the wide range of specific poverty-environment interactions, by ecosystem, land use, and by rural-urban division. Policies and programmes to address these interactions need to be sensitive to the high degree of complexity (both ecological and socio-economic), and need to be able to address resource conflicts and to make trade-offs between competing aims. Specific actions at the local level require local government agents, for example, to fully understand the interactions between poor households and environmental resources.

Capacity development at the national level includes enhancing the institutional and analytical capacity to effectively utilise and apply appropriate tools of environmental management, and to integrate environmental, social and economic aspects, for example through the processes to be followed in developing national strategies for sustainable development. A large number of possible measures for capacity strengthening need to be implemented with Ministries of Environment, Agriculture, Fisheries, Land, Municipal authorities, and others.

There needs also to be further strengthening of capacity at the local level, especially in the context of decentralisation. Programmes which address poverty-environment interactions at the local level need to include, as well as resource users themselves, natural resource personnel in government departments, development workers in NGOs addressing livelihoods issues, and private sector

personnel where they are influencing poverty-environment interactions, for example logging companies. Capacity development work needs to address, not just technical elements, but also the need for development workers to adopt participatory approaches in supporting poor households to move towards sustainable livelihoods.

Capacity development work at all levels also needs to promote a stronger awareness of broader environmental values derived from, for example, maintenance of biodiversity or protection of a wetland area.

**IV. SUMMARY TABLE:
SELECTED LINKAGES BETWEEN POVERTY, ENVIRONMENT AND GENDER IN PARTNER DEVELOPING COUNTRIES**

Poverty-Environment-Gender Linkages in Rural Areas	Policy Implications and Possible Action: Macro/Meso Level	Policy Implications and Possible Action: Local/Project Levels
<p>Reliance on ecologically critical common property resources.</p> <p>The poor are often highly dependent on common property resources for their livelihoods. For example, forests and wetlands (often formally owned by the state) provide a variety of goods including food, fodder, fuel, and building materials, representing important sources of sustenance or income for many land-less poor. When these resources are depleted or converted to other uses, these people's livelihoods are directly threatened.</p>	<p>In order to safeguard the livelihoods of poor communities dependent on common property resources, it is necessary to recognise and protect traditional land rights and associated non-depletive resource uses. The potential degradation of open-access resources must be avoided in order to preserve their ecological integrity. Relevant policy measures include:</p> <ol style="list-style-type: none"> 1) Clarifying and formalising individual or communal rights to common property resources and improve security of land tenure for traditional users in order to encourage the protection and sustainable use. These measures generally have a strong gender dimension as rights regimes often discriminate against women constraining their abilities to manage resources sustainably. 2) Ensuring that land use and sectoral development policy and planning take full account of the social and environmental benefits/values of ecologically valuable, but vulnerable, resources and provide for adequate preservation measures. This includes protecting them from indirect effect of economic activities, e.g. pollution, and preventing their outright conversion to other uses. (Relevant sectors include agriculture, water supply, mining, industry, tourism, power, transport, etc.) 	<p>At the local level, this requires developing adaptive tenurial instruments compatible with traditional use patterns and sustainability concerns, and devising ways to address conflict between competing users, focusing specifically on the needs and rights of poor and marginalised groups. Affected communities, both men and women, should be fully consulted in decisions regarding the use of "public" resources upon which they rely.</p> <p>Policies encouraging greater decentralisation of political power could in some cases provide a conducive setting for fostering sound resource management appropriate to local socio-economic conditions. Building capacity for local governments to formulate coherent policies for resource use would often be a prerequisite.</p> <p>This would often involve the development of capacities for participatory social and environmental impact assessments and the subsequent requisite actions at the local level.</p>
<p>These ecosystems also provide a wide range of critical environmental services, including the maintenance of hydrological balance, soil stability, and water purification. They are often important natural habitats for a wide variety of species. A large number of economic sectors (agriculture, fisheries, water supply, etc.) depend indirectly on these services for continued viability and productivity.</p>		

Summary Table. Selected Linkages between Poverty, Environment and Gender in Partner Developing Countries (cont.)

Poverty-Environment-Gender Linkages In Rural Areas	Policy Implications and Possible Action: Macro/Meso Level	Policy Implications and Possible Action: Local/Project Levels
<p>Pressures use open access resources and marginal lands.</p>	<p>Policy measures to address this fall into four categories:</p>	<p>In affected areas, foster crop diversification and provide incentives for the adoption of agricultural crops and practices compatible with watershed preservation, drawing on indigenous knowledge. This would include the provision of infrastructure (farm to market roads); tenure; micro-credits for women and men; basic 'insurance schemes' amongst farmers across regions to diversify risks; and support to ensure food security (e.g. via direct income support or storage facilities) during the transition phase from subsistence crops to ecologically suitable crops for the markets.</p>
<p>Poor and landless farmers are sometimes compelled to resort to settling and cultivating ecologically fragile lands with low economic productivity (e.g. steep mountain slopes or arid lands). This practice is particularly common for 'open access resources' which are not controlled by any user and are thus open to all (e.g. forests where responsible authorities have been unable or unwilling to enforce the ownership). This results in serious erosion and soil degradation, which triggers a need for further land conversion and in turn also often gives rise to conflicts between new settlers and indigenous inhabitants and between pastoralists and agriculturalists.</p>	<p>1) Policies to foster the adoption of land-conserving crops and practices and/or increase options for the production of high-value tradable produce (e.g. tree crops instead of subsistence crop such as rice or maize). This requires facilitating equitable trade between uplands and lowlands. Relevant policy areas include rural trade, financial systems (including microcredit), transport, and food pricing. The provision of secure land tenure systems is also essential in fostering the adoption of intensive, yet sustainable agricultural production, as well as investment in essential infrastructure (water supply, education, health, etc.). The provision of formal property rights to women and men plays a central role in facilitating investments in new and more sustainable production by providing increased access to credits.</p> <p>2) Policies to foster equitable land distribution and agricultural intensification in productive zones, to reduce pressure to settle marginal lands.</p> <p>3) Policies to foster non-farm employment opportunities in rural areas by stimulating entrepreneurship, including in the informal sector. This includes improving access to credit for both women and men, primary education for girls and boys across class and caste, and provision of basic infrastructure (such as transport, power and communications) in rural towns and cities.</p> <p>4) Address demographic pressures by providing education on health, incl. Reproductive health, to women and men.</p>	<p>Directing agricultural research, extension and education towards improving farming systems and land management practices in marginal or fragile lands would also play a supporting role. The indigenous knowledge of women and men in these areas should be fully utilised in developing improvements.</p> <p>These measures are strongly complementary with other measures to improve well-being for communities living in isolated areas and lacking access to education, health facilities, infrastructure, transport, etc. The differences in the roles and priorities of men and women should be recognised to ensure sustainability of programmes.</p> <p>Build local level capacity to prevent and manage conflict over land and other resources, while paying careful attention to the rights and needs of indigenous people.</p>
<p>Root causes of such migration common among the poorest sectors of the population include demographic growth, scarcity of land, unequal land distribution and shortage of alternative income opportunities in the non-farm sector. (Deforestation and land degradation resulting from 'slash and burn' agriculture in uplands under population pressure is a common practice of the poor in some areas. Similarly, land degradation and desertification from overgrazing and poor agricultural practices are a critical problem in many arid zones).</p>		

Poverty-Environment-Gender Linkages In Rural Areas	Policy Implications and Possible Action: Macro/Meso Level	Policy Implications and Possible Action: Local/Project Levels
<p>Effects of natural disasters on natural resources and livelihoods</p>		
<p>Natural disasters, such as droughts, often result in heavy crop and livestock losses in which the poor are disproportionately hurt since they are most dependent on agriculture and have least options of income diversification. Moreover, in case of crisis the poor have to borrow their way out of trouble at exorbitant rates of interest or engage in distress sales of e.g. livestock at depressed prices. Either way, they are left highly vulnerable to other shocks in the future and are possibly trapped permanently in chronic poverty.</p>	<p>Improvements in national climatological, meteorological and hydrological capabilities to enhance drought or storm early warning and response capacities.</p> <p>Strengthening of drought preparedness and management, including drought contingency plans at national, regional and local levels.</p> <p>Efficient management of emergency relief and food aid.</p> <p>Improvements in food stocking and distribution systems.</p> <p>Provision of alternative livelihoods for drought-prone areas.</p> <p>Development of sustainable irrigation programmes for both crops and livestock.</p>	<p>Human lives and livelihoods ought to be physically protected, e.g. by shelters or dykes against floods (possibly combined with early warning-systems).</p> <p>“Proofing” can further diminish the economic risks for poor people from natural disasters. For instance, in places prone to droughts and floods actions could include the creation of community food banks, availability of credit, and development of innovative forms of insurance.</p>

Summary Table. Selected Linkages between Poverty, Environment and Gender in Partner Developing Countries (cont.)

Poverty-Environment-Gender Linkages In Urban Areas	Policy Implications and Possible Action: Macro/Meso Level	Policy Implications and Possible Action: Local/Project Levels
<p>Unsanitary conditions in poor urban settlements.</p> <p>Poor urban settlements are often characterised by unhealthy and unsanitary conditions, due to lack of access to safe water and drainage, overcrowding, high levels of indoor pollution from carbon fuels, etc. Such informal settlements are often located in the vicinity of contaminated areas or industrial sites. Exposure to a wide range of biological pathogens leads to increased rates of morbidity and mortality, loss of income, social exclusion and restricted social mobility.</p>	<p>Shanty towns are generally unplanned and illegally established, and often ignored by the urban authorities. The risk of encouraging unlawful behaviour by seemingly condoning such illegal action poses a critical dilemma. In addressing the following approaches dealing with shanty town settlements, this dilemma must be kept in mind:</p> <p>Improved legislation for security of property and land tenure would encourage investment in basic infrastructure (e.g. sanitation and drainage) and community initiatives for the provision of basic services (e.g. garbage collection). Secure tenure is also a precondition for access to credit. Providing formal recognition to shanty towns would create incentives for service utilities to extend their network to these communities (e.g. water and electricity).</p> <p>Strengthened urban planning and standards (e.g. building codes), could help control overcrowded and sub-standard construction.</p> <p>Public participation at the lowest level of subsidiarity is essential in this process, and locally based NGOs should be involved. It may be necessary to pay special attention to the inclusion of women's perspectives in policy and decision-making processes.</p>	<p>Slum improvement programmes should provide financial and/or technical assistance in order to establish basic sanitation facilities, increase access to primary health care and schools, and switch to cleaner domestic fuels. Community initiatives to provide services (e.g. waste disposal) should be encouraged, taking into account that gender stereotyping about appropriate work may limit the potential for women's involvement in programmes (e.g. business opportunities) promoting environmentally sound practices.</p> <p>Education and information campaigns targeted at slum dwellers can create awareness of environmentally related health problems and disease vectors and how to deal with them. Maternal education in particular increases overall family health, reproductive health and lowers fertility rates.</p> <p>These measures will in particular lead to better health and free up time for women for alternative income activities.</p>
<p>Vulnerability to natural disasters.</p> <p>Informal urban settlements are frequently located in disaster-prone areas, which leaves them vulnerable to natural disasters (land slides, floods, weather induced catastrophes, etc.). The impact of disaster is often intensified by high-density urban living.</p>		<p>Develop detailed local plans in co-operation with the affected parties for emergency evacuation.</p> <p>Where resettlement is unavoidable for geophysical reasons, alternatives should be provided with due regard for the needs of the affected parties (e.g. job opportunities).</p>

Poverty-Environment-Gender Linkages In Urban Areas	Policy Implications and Possible Action: Macro/Meso Level	Policy Implications and Possible Action: Local/Project Levels
<p>Lack of access to piped water The provision of piped water and sanitation to poor settlements is often very limited. Water utilities often characterised by financial mis-management and inadequate tariff structures hampering maintenance and expansion of the network. It is always the poor who are hurt most by the rationing which accompanies inefficient and uneconomic delivery systems (e.g. they often have to buy water from vendors at higher prices).</p>	<p>In order to improve access by the poor, water should be treated as an economic good. This implies encouraging the application of user and polluter fees, taking economic, environmental and social considerations into account. Investment (public/private) in water supply and sewage infrastructure to poor settlements can be promoted, in particular, through adequate pricing, secure tenure and improved urban planning. This requires developing a legal and regulatory framework for decentralising responsibilities and transferring service delivery functions from the public sector to financially autonomous entities, private sector organisations and communities.</p>	<p>Reform of existing water utility enterprises to ensure application of full cost tariffs, including abstraction fees and polluter charges. For consumers, however, potable water is a basic need. It may be necessary to set low life-line tariffs for low income groups, and higher tariffs for higher consumption to allow for some cross-subsidisation. Build capacity for improved financial management in water utilities. Improved access to water would decrease women's workload as caretakers.</p>
<p>Exposure to pollution from transport. Poor people are disproportionately affected by air pollution resulting from deficient traffic management, use of heavily polluting fuels, and degraded road networks. They often live in congested areas, as the rent tend to be lower and they often travel further to get to work.</p>	<p>Minimisation of transport related air pollution requires strategic urban transport planning. This may also entail discouraging industrialisation of inner cities and other measures to reduce congestion. The introduction of alternative and affordable fuel sources (such as lead free petrol and low sulphur diesel) would decrease pollution levels. This could be promoted via an appropriate tax structure on fuels, e.g. reduction of subsidies and transition towards full-cost pricing.</p>	<p>Improve traffic management e.g. by diverting heavily polluting vehicles from congested urban settlements. Stimulate investments in establishing and/or improving public transportation. Create incentives for increased use of public transportation, and improve security for users, especially women.</p>
<p>Exposure to pollution from industry. Poor people are disproportionately affected by chemical pathogens emitted by industry as housing prices are lower in industrial areas.</p>	<p>Improved environmental legislation in accordance with the polluter pays principle and industrial pollution standards could promote the implementation of cleaner technologies and production methods. Such measures should be subject to social and environmental assessments. The constraints of the surrounding physical environment should be considered in strategic industrial planning, in order to minimise the impact of pollution.</p>	<p>Develop the capacity of urban authorities for firmer monitoring and enforcement of environmental legislation. Foster investment in industrial pollution control, e.g. for waste water treatment and recycling, handling of toxic and hazardous waste, and energy efficiency measures.</p>

ANNEX 1. “SHIFTING CULTIVATION” AND “FRONTIER” FARMING

“Shifting cultivation” - also known as swidden farming or slash-and-burn agriculture refers to any cyclical agricultural system that involves clearing of land followed by phases of cultivation and fallow periods. It is important to differentiate between the wide variety of practices which the term refers to. These range from highly diverse and stable rotational systems to the unrestrained conversion of forested land to mono-crop agriculture, leading to rapid soil erosion and soil exhaustion.²²

1. Long fallow shifting cultivation

Under conditions of low population density and isolation from markets (where labour and technology rather than land are the main limiting factor in agricultural production) long fallow cultivations generally represent highly efficient and stable systems. Such agricultural practices have generally been developed over generations. Communities relying on long-fallow agriculture generally combine the cultivation of subsistence crops with the exploitation of a wide range of non-timber forest products (including oil-bearing fruits and seeds, mushrooms, leaves, vines and rattans, bushmeat and skins). These systems, which allow for a diverse and rapid re-growth of secondary forests, are characterised by a degree of species and crop diversity. Shifting cultivation is the traditional form of agricultural production for many ethnic minorities, who have a long tradition of shifting cultivation. Where population growth leads to increasing pressures on resource use, long fallow systems often evolve to more intensive systems, involving the use of land-enriching leguminous crops and a variety of agro-forestry techniques.

2. Shortening fallow period and sedentarisation

Increasing population density undermines the viability of long fallow systems. Successful adaptation requires increasing productivity through improved techniques such as irrigation and contour farming and, over time, the abandonment of shifting cultivation techniques in favour of sedentary systems. This often involves a shift away from annual crops to perennial tree crops. The shift to sedentary lifestyles has other benefits including improved access to basic services such as education, transport, access to health care, information etc. Aside from agro-ecological conditions and cultural factors, the scope for successful sedentarisation hinges on access to inputs, technology and markets. Isolated from markets, farmers have no scope for specialising in those crops suitable to land conditions (notably tree crops) and have no choice but to concentrate on food crops for subsistence. Access to capital also conditions the ability to invest in such expensive infrastructure as irrigation or contour farming. Security of land tenure is another precondition. Without these elements, short fallow farming practices lead to severe land degradation.

²²

The threshold depends on factors such as the susceptibility of land to deterioration, previous farming history, and crop-site compatibility.

3. “Subsistence “ frontier farming

“Frontier farming” is the expansion of small-scale agriculture. This is often takes place in the wake of logging activities, which open up hitherto inaccessible areas. The process starts with logging followed by land clearance through burning²³. The land is then cultivated until soil fertility is exhausted and subsequently abandoned. “Frontier farmers”, generally landless peasants, have no tradition of living in or farming forest land and typically apply the techniques and crops in use in their area of origin. On steep slopes, which are highly susceptible to erosion once the protective vegetative cover has been removed, this has severe environmental impacts. To find new lands to practice this "pioneer" shifting cultivation, people often have to travel great distances. The presence of migrants in increasing numbers often leads to conflicts with the indigenous communities.

²³ Poorly constructed logging roads are in themselves a major cause of soil erosion.

ANNEX 2. TENURIAL REFORM: CRITICAL LIVELIHOOD-RELATED QUESTIONS

Given the inherent complexity of land tenure systems and the limited capacity of the state, efforts towards tenurial reform must begin with a detailed review of the political, economic and social context. This is essential to ensure that tenurial reform plays its full role in reducing poverty and securing sustainable livelihoods. Factors to be considered include:

Political factors: Do political conditions favour tenure reform? How effective is the administration of land tenure at national, regional and local levels?

Economic factors: How do tenure systems affect agrarian and other sources of production and income? What economic use is made of common property resources? How does the land tenure system intersect with markets for land, capital, labour, inputs and outputs? Does lack of clarity about land rights discourage investment?

Social and cultural factors: How are rights to land embedded within wider social and cultural relationships? What is the impact of the structure of land rights on gender inequality? Are tenure systems associated with class, racial/ethnic and/or other forms of inequality? Are rights to land an important source of asset-based security for the poor? How have colonial and post-colonial laws affected indigenous tenure forms? How do reform policies interact with informal evolutionary processes?

Legal factors: Do constitutional and legal frameworks affect tenure? Are there appropriate and legally secure options for rural and urban situations? What is the legal basis of common property arrangements? When and where are titling and registration programmes appropriate? Do group forms of ownership require titling and registration?

ANNEX 3. ESTABLISHING AND MAINTAINING EFFECTIVE ACCESS TO WATER

A. FACILITATING ACCESS TO AFFORDABLE WATER AND SANITATION TO THE POOR

Options to improve water and sanitation in shanty settlements – and maximise the scope for recovering costs in order to ensure sustainability – vary considerably from settlement to settlement.

Technical issues: These include the cost of supply, which depends on a settlement's distance from existing water mains, sewers and drains, topography, soil structure, settlement density and layout, and the potential for tapping local water resources.

Institutional issues: These include the attitude of the authorities responsible with regard to the provision of water and sanitation in shantytowns and unauthorised settlements generally and the status of the inhabitants (whether they are 'owners' or tenants). It is difficult for any water agency to provide house connections and receive regular payments in settlements where it is not clear who owns what plot and where houses do not have an official address. The possibilities for improving provision of public infrastructure and services in settlements with insecure tenure are therefore more limited.

Demand factors: Detailed information on existing (formal and informal) systems and businesses that are already providing water and sanitation is essential. This should include an analysis of different residents' needs, priorities and ability and willingness to pay. Some communities having secured sufficient access to water through informal means may have other priorities.

Institutional innovations: Community provisions:

Where it is too expensive or too difficult institutionally to provide piped water connections to each house or yard, there are a range of measures to improve provision and increase the scope for cost recovery. The water agency can provide connections to water mains and trunk sewers at the settlement's boundary with the inhabitants organising the systems within their settlements. The agency thus 'wholesales' water to a community that assumes responsibility for collecting payments from households. Community water meters avoid the costs of providing and monitoring individual house meters.

Similar approaches are applicable for communities that are too distant from water mains to be connected. A water agency may for instance deliver bulk water to a large tank with the community organisation taking on the task of piping the water into each household and collecting payments.

Payment procedures: Access to water and sanitation can be facilitated by allowing the initial connected charges to be paid over several months and integrated into service charges or through providing loans.

There are many examples of successful community-based savings and loan schemes to allow low-income household to obtain access to water and sanitation.

Cost minimising options:

Partial self provision: The costs of installing pipes for water and/or sanitation can be considerably reduced if household and/or community organisations are prepared to dig the ditches and ensure houses are prepared for connections. This may allow good quality 'expensive' solutions to be installed for low income households with full cost recovery. Using smaller pipes and shallower

trenches, shallower gradients and interceptor tanks can also reduce the cost of installing sewerage systems, though changes in demand over the longer term should also be considered

Sewer-less sanitation: Many options exist for safe, good quality ‘sewer-less’ sanitation. The costs of on-site’ sanitation options - for instance ‘ventilated improved pit’ (VIP) latrines, pour-flush toilets linked to community septic tanks - are generally lower. Such facilities require regular emptying and disposal, a hazardous task best performed by specialists. The need for affordable maintenance services is often overlooked.

In large and high density residential areas, unit costs for sewer systems may be comparable to sewer-less systems. Those are generally much preferred by the inhabitants because they also remove wastewater and do not require regular emptying. The choice between these two systems is dictated by local conditions such as soil conditions, ease with which pits can be dug and groundwater levels. The costs of sewage treatment however have to be factored into comparisons between these systems: failure to provide for adequate treatment will result in major external costs to human health and to the environment.

B. REFORMING WATER UTILITIES: PRIORITY ISSUES

The principal constraints facing water utilities include:

- Legal statutes which do not enable them to ensure the provision of safe drinking water or to exert control on activities which affect the quality of the water resources.
- Direct and indirect subsidies which make it difficult to develop a financing system based on cost-recovery.
- Tariff levels which do not provide sufficient incentives for the efficient use of water and encourage excessive use.
- Insufficient revenues for investments and other expenditures and a concentration on capital investment, without sufficient attention paid to operations and maintenance.

Priority institutional and reform needs include:

- Clarifying legal status to reinforce the autonomy and accountability of water utilities so that they are more attractive for private sector investment and public-private partnership arrangements.
- Ensuring compliance with water quality and effluent standards.
- Developing the use of user and polluter charges based on the User/Polluter Pays principle, taking economic, environmental and social consideration into account.
- Reforming tariff structures to enable the development of self-financing systems that will enable water services to be provided on a commercially viable basis (taking into account affordability considerations).
- Improving operational and financial performance so as to improve their commercial viability, for example by:
 - increasing billing and collection efficiency;
 - encouraging reduction in operating costs;
 - strengthening capacity to plan and carry out complex capital investment projects, for example in association with public-private sector partnerships;
 - strengthening transparency in relations with the authorities, clients and media so as to facilitate public-private sector partnerships; and
 - exploring opportunities for raising additional finance (e.g. through private sector investment) for improvement and expansion of water services.

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