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Natural Resources and Pro-Poor Growth

THE ECONOMICS AND POLITICS



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A Good Practice Paper

Natural Resources and Pro-Poor Growth

THE ECONOMICS AND POLITICS



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Foreword

It is widely acknowledged that the eradication of poverty and the achievement of the Millennium Development Goals are closely linked to sound natural resource and environmental management. Threats to the environment and natural resources, coupled with poor management, have serious implications for both poverty reduction and sustainable economic development.

The "OECD Environmental Strategy for the First Decade of the 21st Century", adopted in 2001, and the 2008 OECD Environmental Outlook *recognise these linkages and the need for co-operative action to support effective and sustainable natural resource management in developing countries.*

Natural Resources and Pro-Poor Growth: The Economics and Politics *highlights the potential for natural resource management and environmental stewardship to contribute to poverty reduction and economic development of developing countries. It shows how effective policy making and investments aimed at natural resource management can support economic development, poverty reduction, job creation and long-term sustainability of natural resource-based activities.*

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Preface

If economic growth, poverty reduction and industrial development are top priorities for most developing countries, why should policy makers in partner and donor countries worry about natural resources?

The answer is simple: natural resources provide soil to grow food, and water for drinking, washing and irrigation. Forests and rivers provide fish to eat or export and raw materials for a wide range of industries. In many countries natural landscapes and wildlife reserves are major factors in attracting tourism. So managing natural resources properly is actually about safeguarding food production, and about preserving livelihoods and export opportunities.

Moreover, in economic terms, natural capital constitutes a quarter of total wealth in low-income countries and natural resources are often the principal source of income of the poorest people.

Various global environmental assessments show a continuous decline of natural resources, increasing the vulnerability of the poor as a result of ecosystem stress, competition for space, soaring food and energy prices and climate change. Concerns about the implications of environmental degradation have never been as widely documented and shared as today.

By contrast, the resultant lost opportunities for economic development and poverty reduction in developing countries have received scant attention. This publication tries to make amends by highlighting the many contributions natural resources can make to economic development and the critical role sound natural resource management plays in pro-poor growth strategies.

But better management of natural resources will not automatically lead to poverty reduction. What is needed are conducive political, institutional and governance frameworks. Empowerment of the poor, women and marginalised groups is essential.

This publication presents a wealth of examples to adopt and replicate, demonstrating how countries can support a process towards pro-poor growth that has to begin with the assets that the poor already possess. It presents a number of ideas and recommendations which can facilitate the path to better laws, regulations, knowledge and information, institutions, investments and transparent decision-making for natural resources and pro-poor growth. It analyses the current situation and lists ways of transforming negative environmental trends into improved opportunities for income generation, economic growth, stability and resilience to natural hazards.

Let us be more aware of the opportunities represented by the world's natural heritage and make every effort to bring about proper political processes and decisions that will enable the world's natural resources to be enjoyed in a fair and sustainable manner.



Bert Koenders,
Minister for Development Co-operation
of the Kingdom of the Netherlands



Eckhard Deutscher,
Chairman,
Development Assistance Committee

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Natural Resources and Pro-Poor Growth: The Economics and Politics

Executive summary

Natural resources can generate and sustain growth, thereby reducing poverty and supporting the achievement of the Millennium Development Goals (MDGs). It is therefore urgent to improve natural resource management for long-term pro-poor economic growth, *i.e.* a pace and pattern of growth that enhances the ability of poor women and men to participate in, contribute to and benefit from growth.

Moreover, the international context of natural resource management is changing. Many emerging economies are major importers of natural resources. This increased demand for natural resources makes improved resource management even more urgent.

This publication focuses on the economic dimensions of natural resource management. It is intended to encourage decision makers from development co-operation agencies and ministries of finance and planning in partner countries to recognise the contribution of natural resources to pro-poor growth and the importance of policies which nurture their sustainable management.

It also provides an overview of the "politics" of natural resource management, aimed at identifying the roles and influence of different stakeholders and their incentives and disincentives for sustainable natural resource use. It points to the need for innovative coalitions to drive change and promote sustainable management. Past approaches that focused on more technocratic interventions have often overlooked these political challenges. Additionally, ways to increase policy coherence for development in natural resource management are outlined. Policy makers in OECD and partner countries, as well as development co-operation agencies, are in prime positions to address the political challenges of natural resource management for long-term pro-poor economic growth.

Seven natural resource sectors are examined which have a critical role to play in sustaining pro-poor growth. They are: fisheries, forests, wildlife and nature-based tourism, soil productivity, water security, minerals, and renewable energy. They are all key natural resources which, if effectively managed, can contribute to sustainable pro-poor growth.

Introduction to Part I: Overview of key issues

Generating pro-poor growth is key to the achievement of the MDGs. There is a consensus that, over the long term, economic growth is an essential requirement and, frequently, the main contributing factor in reducing income poverty. Evidence across countries and time shows that long-term reduction in income poverty results first and foremost from growth. At the same time, developing countries with similar rates of economic growth have experienced quite different levels of economic poverty reduction. This is due to initial conditions (particularly levels of inequality in incomes and assets) and whether growth occurs in areas and sectors where the poor live and are economically active. The pattern and pace of growth are thus interlinked and need to be addressed together in order to have a substantial and sustained impact on poverty reduction.

While the proportion of the world's poor living in towns and cities is gradually rising, most of the world's poor will continue to live in rural areas for many decades to come. Poor people's livelihoods will remain heavily dependent on natural resources: soil, water, forests and fisheries underpin commercial and subsistence activities and often provide a safety net for the poor in times of crisis. Strategies for rural poverty reduction, including pro-poor natural resource management, should remain at centre stage for poverty reduction.

Natural capital contributes directly to economic incomes, employment and fiscal revenues. Natural resources, renewable and non-renewable, are fundamental to economic activity in many ways. Goods produced from renewable natural capital include timber and non-timber forest products, catches of wild fish, etc. Goods produced from non-renewable natural resources are mainly oil and minerals. These goods form the basis of the economy in many developing countries. Examples include the forestry wealth of Cameroon and Indonesia and the fishery wealth of Mauritania and the Pacific islands. Nature-based tourism is an important component of the international tourist receipts earned in some low-income countries in Africa, Asia and Latin America. Soil and water resources are essential for agricultural activities, a key part of the economy in many developing countries. Mineral extraction contributes considerably to the wealth of countries such as Kuwait and Botswana. Renewable energy can play a key role in providing poor people with energy access.

Natural capital is particularly important in developing countries. It accounts for an estimated 26% of total wealth in low-income countries, 13% of wealth in middle-income countries and only 2% of wealth in industrialised or OECD countries. Moreover, primary production represents a much higher share of production, domestic trade, exports and national income in developing countries compared with that in industrialised countries. Natural resource-based enterprises thus provide important employment and income opportunities.

Natural resources underpin the livelihoods of many among the poorest. The poor are often highly dependent on "common property" natural resources, which include fallow fields, forests, fishing grounds, pastureland and wetlands, for their livelihoods. For many rural poor, common property natural resources are an important source of food, fodder, fuel, building materials, medicinal plants and income. In India, it has been estimated that common property resources provide about 12% of household income to poor families. In general the poorer the household, the more important is the income contribution through common property resources.

Natural resources generate a wide range of positive externalities at the local, national and global levels. In addition to goods, natural resources produce services; for example, water filtration and purification services provided by wetlands or regulations of water cycles provided by watersheds. **Local or national-level natural resource services** include, for example, the soil stability provided by upstream vegetation in a watershed, which contributes to the good functioning of downstream water supply, irrigation or hydro-electric facilities. **Global level services** include carbon sequestration by forests or soils, which helps mitigate climate change.

Sustainable natural resource management raises unique challenges. Sustainable management of resources rests on a capacity to monitor the evolution of stocks and take corrective action in cases of significant degradation or decline.

Natural resource management gives rise to unique challenges. Natural resource-based economies are vulnerable to "boom and bust" cycles, *i.e.* large terms of trade shocks caused by sharp falls in the prices of main export commodities. In addition, when a country suddenly discovers large quantities of natural resources and starts exporting them, or an existing resource sector increases its weight in the export market quickly, this can result in a significant change in the rate of exchange which in turn can lead to a decrease in competitiveness of other sectors. This situation is known as "Dutch disease". Stabilisation funds, specific public investment funded by windfall revenue, the use of conservative price assumptions for major export commodities, export diversification, appropriate use of tax systems, and keeping external debt at a sustainable level are some important policy responses to these "boom and bust" cycles and "Dutch disease". Payment for environmental service schemes and specially designed market mechanisms for environmental services such as carbon sequestration may also help to address the "absent market" challenge.

Furthermore, the international context of natural resource management is changing. Many emerging economies are major importers of natural resources. This increased demand for natural resources makes improved resource management even more urgent.

With sound management, natural resources can provide the basis for long-term sustainable pro-poor growth. To ensure that natural resources help not only support but also sustain growth, they need to be used efficiently, equitably and sustainably. For example, their commercial value can be maximised through increased quality or processing and their productivity can be increased through investment in human and man-made capital. Fiscal revenues can be channelled towards pro-poor investments, while framework conditions for policies that promote diversification away from natural resource extraction can facilitate more value-added activities.

The conversion of natural resources into other forms of capital, including social and human capital, can provide a basis for sustainable growth only if certain conditions are met (*e.g.* through investment in education). Decisions to convert natural resources into other forms of wealth must take into account all relevant social, economic and environmental factors. There are often trade-offs between different stakeholders as well as critical thresholds of conversion which must not be reached. Beyond certain limits, natural resource wealth and the associated flow of economic, social and environmental benefits can collapse, sometimes irreversibly. Certain natural resources are irreplaceable and need to be preserved to sustain long-term growth and inter-generational equity.

The political and governance dimensions play a key role in pro-poor natural resources management. Governance of natural resources should be informed by the characteristics of those resources, the actors involved and the institutional framework and rules. The special characteristics of natural resources (such as unclear property rights, multiple claims and functions, lack of market prices, remote location and difficult access), in combination with weak institutions, give rise to special challenges in this regard.

These challenges include, in particular, the potential for elite groups to monopolise access to resources and exclude the poor. As a result, the benefits from natural resources often accrue to a small elite and do not contribute to the country's growth, let alone contribute to lifting people out of poverty. Aside from issues linked to corruption and poor governance, the multiple potential uses of natural resources – often mutually exclusive – give rise to a host of trade-offs and competing interests and objectives.

Governance of natural resources requires choosing policies that have political dimensions, such as market-based measures, regulation, co-operation, and information. The distributional impacts of these policies vary. To ensure pro-poor results, particular attention should be paid to a meaningful participation of the poor in governance processes.

Political change can not be imposed from the outside. It must be based on broad ownership of decision-making processes. "Coalitions for change" (led by all citizens, civil society organisations, politicians, government bodies, the private sector and development agencies) can facilitate policy changes in support of natural resource management for pro-poor growth. A key challenge of political change is to move changes initiated at the local level up to the national level.

Conclusions and recommendations for policy makers

Some fundamental facts deserve more attention from policy makers if growth is to unfold its full potential for lasting poverty reduction. First, poor countries are much more dependent on natural resources as economic assets than are rich countries. Second, natural resources are a major – if not **the** major – asset of the poor. Third, the international context of natural resource management is changing. Many emerging economies are major importers of natural resources. This increased demand for natural resources makes improved resource management even more urgent.

Policy makers in OECD and developing countries as well as development co-operation agencies can play an important role in promoting political change to support natural resource management for pro-poor growth. First, development co-operation can facilitate improved natural resource management, for example, by funding projects to build the capacity of community-based co-operatives or organisations to manage natural resources. It can encourage clarification of land tenure and resource rights of the local poor including customary tenure and resource management rights. It can promote the use of tools such as participatory rural appraisal, strategic environmental assessment and poverty and social impact assessment to enhance long-term thinking and pro-poor strategic planning of natural resource use. Second, policy coherence for development should be enhanced. This implies making sure that the policies of industrialised countries in areas other than development co-operation give support to, or at least do not undermine, efforts by developing countries to attain internationally agreed development goals. Policies of emerging economies have to be aligned with these goals as well. Third, existing and potential future multilateral environmental agreements must be negotiated in a manner that is particularly sensitive to the needs of the poor. This requires political support for improved and secured access of the poor to natural resources in the context of negotiations of multilateral environmental agreements.

Checklist for practitioners

A checklist at the end of Part One aims to translate key messages into concrete action. It contains indicative questions on natural resources and pro-poor growth linkages. These questions can be considered and addressed by practitioners of natural resource management in development agencies and their partners in developing countries to improve natural resource management.

Introduction to Part II: Key natural resources for pro-poor growth

This section examines seven natural resource sectors which have a critical role to play in sustaining pro-poor growth: fisheries; forests; wildlife and nature-based tourism; soil productivity; water security; minerals; and renewable energy. These have been selected as key resources which, with improved management, can contribute to the growth process and in particular sustainable pro-poor growth. To support the analysis, a number of case studies have been prepared and are available on the Internet (*www.povertyenvironment.net/pep*).

Fisheries

Fisheries are an important source of wealth for many coastal and island developing countries. With about 95% of the world's 35 million fishermen living in developing countries, fisheries provide a critical source of food for millions. Internationally traded values in fish products from developing countries far exceed all other export commodities, and some countries generate up to 30% of their fiscal revenues through fisheries.

Fish stocks in many coastal areas of the developing world are severely threatened by overfishing. Institutional weaknesses, lack of capacity for effective policy implementation, as well as the migratory and open access character of fish resources underlie overexploitation. To reconcile the joint objectives of growth, poverty reduction and the safeguarding of the fishery resource, effective resource management is needed. Several political and management challenges in the fisheries industry, including illegal and unreported fishing, have to be addressed. Additionally, difficult choices on potential trade-offs between large-scale industrialised fishing and local small-scale fishermen have to be made, and more public revenues from fisheries have to be generated. Notwithstanding these challenges, with improved management fisheries can contribute increasingly to pro-poor growth, as several countries have shown.

Forestry

The forest industry is a major source of growth and employment. In many countries, the sector contributes more than 10% to GDP and provides formal and informal employment in developing countries for an estimated 40 to 60 million people. Developing countries also rely on timber for export earnings. Over 90% of the people living in extreme poverty depend on forests for some part of their livelihoods. But global forest cover has been reduced by at least 20% since pre-agricultural times. While forest area has increased slightly since 1980 in industrial countries, it has declined by almost 10% in developing countries.

Natural forests, as distinct from tree plantations, are valuable resources that are under state ownership in most countries. But weak enforcement of forest management regulations and large-scale corruption limit the potential of forest for poverty reduction in many states. Better institutions are needed both for ensuring the long-term sustainability of the forest sector and for the purposes of improving revenue capture by the state. There are positive experiences in South Asia, Latin America and Africa from which lessons can be learned.

Wildlife and nature-based tourism

Wildlife plays an important safety net role for many poor people. It provides food, fibre and medicines – but it can also be a source of wealth creation. An estimated 150 million poor people (one-eighth of the world's poorest) perceive wildlife to be an important livelihood asset.

Nature-based tourism holds high potential for wildlife-based economic growth. It is one of the fastest growing segments of the global tourism industry, and one of the few export/service sectors in which poor countries have (or can develop) a clear comparative advantage as a result of their often rich natural resource base. Trophy-hunting can be a particularly lucrative sector of this industry for some states, generating significant public revenues in countries such as Tanzania.

Wildlife trade also deserves far greater attention – generating an estimated USD 15 billion per annum worldwide, excluding large-scale commercial trade in fish and timber. But overexploitation of species and illegal wildlife trade can be very economically and ecologically damaging. Better management, regulation and controls are needed to realise the potential of wildlife trade for pro-poor growth.

Soil productivity

Soil productivity is essential to agricultural growth, food security and support of the livelihoods of the poor. Agriculture is the major engine of economic growth in most developing countries, and growth in agriculture is particularly effective in reducing poverty. Low-income countries have the highest share of agriculture in GDP (typically, around 30%), as compared to less than 4% in high-income countries. Furthermore, a 1% increase in agricultural GDP leads to a 1.6% increase in the per capita income of the poorest fifth of the population. Additionally, the agricultural sector has to meet the food needs of an additional 1.7 billion people over the next 20 years. But pro-poor growth and food production are at risk from severe soil degradation.

Soil degradation has reduced agricultural productivity by 1% to 9% in Africa. More than 16% of the cropland and drylands in low-income countries have been degraded moderately or severely, primarily through soil erosion, nutrient depletion and salinisation. Soil degradation ranks among today's greatest environmental challenges. Considering the enormous cost of soil degradation, investment in improving soil fertility is remarkably low for a variety of reasons related to tenure, access to credit and markets, and fiscal and trade policies. Given the growing pressure on land in the developing world, the economic value of soil conservation is likely to increase.

Water security

In many of the world's poorest countries, there is often a strong correlation between rainfall variability and GDP performance. The importance of the contribution of water resources to pro-poor growth lies in the irreplaceable role of water for drinking and washing in the daily lives of every human being as well as in its role as an input into other sectors such as (irrigated) agriculture, energy and industry. While developed countries have managed to harness water resources to sustain economic development through investments in institutions and infrastructure, least-developed economies are often challenged by marked climate seasonality, variability and/or rainfall extremes, while

capacity, institutions and infrastructure to manage and mitigate these potentially major challenges are generally inadequate.

There is a re-emerging consensus that water resources development and management are essential not only for human well-being but also to generate wealth, mitigate risk, and alleviate poverty. Many developing countries will need to make large investments in water infrastructure at all levels. Furthermore, greater attention must be paid to institutional development, to the environment and to a more equitable sharing of benefits and costs.

Minerals

The mineral industry extracts non-renewable resources. To create and sustain wealth in the long term, mineral resources have to be converted into other forms of capital (human, social, financial and manufactured) and more sustainable livelihood opportunities.

Mining is an important source of growth, government revenues and foreign investment in many developing countries. The sector employs an estimated 22 to 25 million people worldwide, most of whom are abjectly poor. It includes those working in the artisanal (self-employed, independent and/or subsistence) and small-scale mining operations in developing countries. Furthermore, the economic importance of the sector is increasing. Between 2000 and 2005 the value of world trade in minerals grew by 17% annually. Mineral prices are volatile and have risen significantly in the past five years, driven in part by high demand and growth rates in China and India.

But mineral wealth does not automatically lead to economic prosperity and poverty reduction. Some resource-rich countries are among the poorest of the world and have high levels of corruption and conflict. The challenge is to recognise the potential for the "resource curse" and work effectively to counter it. Good governance, strong institutions, effective regulation and rigorous environmental and social safeguards are needed to realise the potential of mineral wealth for pro-poor growth. Both OECD and developing countries have shown how well-governed mineral wealth exploitation can power development.

Renewable energy

Renewable energy can play a key role in providing a more sustainable, equitable and secure energy supply for sustaining pro-poor economic growth and supporting the achievement of the MDGs. Access to energy is one of the keys to development and economic growth, as it provides light and heat, and powers productive and reproductive uses and telecommunications. But current energy systems are unable to provide energy to all people in a sustainable and affordable way. It is estimated that 1.6 billion people do not have access to modern forms of energy, most of them living in rural areas in developing countries, far from centralised energy systems. Hence recognition is growing that new sources and patterns of energy supply and consumption, in particular forms of decentralised renewable energy, are needed to move toward greater sustainability.

PART I

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PART I

Chapter 1

Introduction

"There is one final factor which will obviously be a major influence on Africa's future economic growth. It is the environment."

Commission for Africa, 2005

"The 21st century will be marked by a crucial debate: how can we make economic and social development compatible with the preservation of the natural environment?"

Luiz Lula de Silva, President of Brazil[1]

"We recognise that the environment is not an obstacle to economic growth, but offers opportunities for sustainable growth."

Ministerial Declaration of the Fifth Ministerial Conference on Environment and Development in Asia and the Pacific, 2005

"Environmental wealth – natural resources – is one of the main sources of growth in developing countries, and central to the livelihoods of poor people."

Hilary Benn, Minister of Development, UK[2]

Generating pro-poor growth is key to achieving the Millennium Development Goals (MDGs). While it is true that the proportion of the world's poor living in towns and cities is gradually rising, three-quarters of all poor people still live in rural areas. The modest pace of urbanisation and current forecasts for urban population growth imply that most of the world's poor will still live in rural areas for many decades to come (Ravallion *et al.*, 2007).

Poor people's livelihoods will remain heavily reliant on natural resources. Soil, water, forests and fisheries underpin commercial and subsistence activities and often provide a safety net for the poor in times of crisis. Strategies for rural poverty reduction, including pro-poor natural resource management, should remain at the centre stage for poverty reduction.

This publication provides an overview of how natural resources can generate and sustain pro-poor growth. It also examines how effective policies and investments for natural resources can support the achievement of the MDGs. The objective is to highlight the need to improve natural resource management for long-term pro-poor economic growth.

Natural resource management and poverty reduction are complex issues and there are many interdependencies. This report focuses on the economic dimensions – *i.e.* benefits of natural resources in terms of production, incomes, employment creation, export revenues and fiscal resources. The many non-market environmental benefits provided by natural ecosystems, their intrinsic and aesthetic value and the threats to human development posed by pollution and other forms of degradation are not addressed specifically here. Recent publications, such as the Millennium Ecosystem Assessment (2005) and "*World Resources 2005 – The Wealth of the Poor: Managing Ecosystems to Fight Poverty*"[3] address these critical issues in comprehensive detail.

Similarly, issues related to climate change are not addressed here. This is not to underplay their importance. Climate change is a serious and long-term challenge to social and economic development with the potential to affect every part of the globe, and developing countries in particular. Studies on the economic damage from climate change show that developing countries are expected to experience larger percentage losses of GDP than developed countries (IPCC, 2007). It should not be considered just as an environmental issue but also as a development issue. Readers are invited to refer to the growing literature on the economic impacts and costs of climate change for a detailed coverage of these issues (see also Box 1.1).

The focus on economic dimensions of natural resource management is intended to encourage economic decision makers from development agencies and ministries of finance and planning in partner countries to recognise the contribution of natural resources to pro-poor growth and the importance of policies encouraging the sustainable management of these resources.

This publication also provides an overview of the politics of natural resources. It outlines governance-related factors that shape the management of natural resources, and

identifies the roles and influence of different stakeholders and their incentives and disincentives for sustainable natural resource use. It points to the need for innovative coalitions to drive change and promote sustainable management. Past approaches focusing on more technocratic interventions and capacity building have often overlooked these political challenges. Additionally, ways to increase policy coherence for development in natural resource management are outlined. Therefore, the publication also signals to policy makers in OECD and partner countries as well as to development co-operation agencies the need to address the political challenges of natural resource management for long-term pro-poor economic growth.

Subsequently, seven natural resources are examined which have a critical role to play in sustaining pro-poor growth: fisheries; forests; oil and minerals; nature-based tourism; soils; water; and renewable energy. These have been selected as key resources whose improved management can contribute to the growth process. To support the analysis in this paper, a number of case studies have been prepared and are available on the web (*www.povertyenvironment.net/pep*).

Box 1.1. **Climate change: The expected impacts on developing countries**

Developing countries are particularly vulnerable to climate change because their economies are generally more dependent on climate-sensitive sectors and natural resources (*e.g.* agriculture and fisheries). They are also less able to adapt as a result of limited human, institutional and financial capacities. Crop yields are projected to decrease by up to 30% in Central and South Asia by the mid-21st century; while in some African countries, yields from rain-fed agriculture could be reduced by up to 50% by 2020. Overall agricultural losses arising from impacts of climate change in Western and Central Africa and parts of the Sahara are estimated to range from 2% to 7% of GDP by 2100 (IPCC, 2007).

Notes

1. "Join Brazil in planting oil", comment, *The Guardian*, 7 March 2006.
2. Speech at New Economics Foundation, 19 January 2006, *www.dfid.gov.uk/news/files/Speeches/wp2006-speeches/growth190106.asp*.
3. This publication is the result of collaboration between UNDP, UNEP, the World Bank and the World Resources Institute.

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PART I

Chapter 2

Some Unique Features of Natural Resources*

This chapter provides an overview of the various forms and functions of natural resources. It highlights why the unique features of natural resources pose special challenges to their effective management.

* This chapter draws on material from Ahrend (2006).

2.1. The varied forms and functions of natural capital

While natural capital assets are not created by human activity, their quality and capacity to yield goods and services – and therefore their value as productive inputs – are affected by it. In many cases, for example agricultural land, the relevant input into production can best be viewed as a combination of natural elements (soil and water) and man-made components (irrigation and transport infrastructure). It is, however, still useful to maintain the conceptual difference between natural and man-made capital.

Natural capital can be either *renewable* (such as land, water resources and forest) or *non-renewable*, including, for example, fossil fuel and mineral deposits. Natural capital is renewable if the resource can restock itself by natural processes. If the rate of extraction respects the limitations of reproductive capacity, renewable natural capital can provide yields over an infinite period of time. Non-renewable capital cannot regenerate at a rate that is comparable to the rate of extraction. Therefore the extraction of non-renewable resources is necessarily finite.

Renewable capital produces a flow of both *goods* and *services*. The two are often compatible. Goods produced from renewable natural capital include timber and non-timber forest products, catches of wild fish, etc. Goods produced from non-renewable natural resources are mainly oil and minerals.

Some of these goods are traded in formal markets and therefore accounted for in national economic statistics. They include, for example, timber and fish harvested by formal-sector operators as well as fossil fuels (oil, gas and coal) and important minerals. But many are consumed locally and do not enter formal markets. They include wild fruits, mushrooms or herbs, wild fish caught by small-scale fishermen, "bush meat", palm, timber and non-timber forest products, among others.

Services produced from natural capital include, for example, water filtration and purification services provided by wetlands, regulation of water cycles provided by watersheds, etc. These services are generally not marketed and are invisible in standard economic statistics.

2.2. Measuring and monitoring natural resource stocks

Sustainable management of resources rests on a capacity to monitor the evolution of stocks and take corrective action in cases of significant degradation or decline.

In the case of man-made physical assets, the cost of maintaining, renewing, expanding and improving the capital stock is an explicit part of production costs (capital depreciation is accounted for as an expense). For natural resources, this is not always the case. The value of natural capital is often not accounted for at the level of the individual firm or in national accounts. This implies that neither their contribution to growth nor the extent and impacts of their degradation or depletion are fully measured and recognised by policy makers. Hence, measuring and monitoring natural resource stocks accurately is a serious challenge.

In the case of *non-renewable resources*, such as minerals or fossil fuels, stock depletion is inevitable in the long run. In the formal sector, the value of the remaining stock (*i.e.* mineral or oil reserves) is estimated as accurately as possible and is an important factor conditioning the market value of the firm relying on a particular resource stock. An appropriately designed fiscal regime can make sure that stock depletion is recorded and thus made visible both at the level of the firm and at the aggregate level.

This does not apply in the case of informal-sector exploitation of "open access" resources. Where artisanal mining is significant or even predominant, for example, it is difficult to monitor the value created by the industry and the rate at which existing deposits are depleted, and to formulate corresponding policies. These issues are discussed in greater detail in Chapter 11.

Renewable natural resources can, in principle, be maintained in perpetuity so long as their rates of use do not exceed their rates of regeneration. However, a continued draw-down of the stock above a certain level may be unsustainable and lead to permanent reduction of the stock and to lower reproductive capacity. There is, however, no market mechanism to make this reduction in capital stock visible to users or policy makers.

Standard economic statistics can even provide a misleading picture of the performance of a natural resource-based sector. In the case of fisheries, for example, a high level of "gross value added" is consistent with poor economic performance if there is excess fishing capacity. In such a case, removing capacity from the sector will result in increased overall production.

Similarly, ecosystems may be degraded to the point where they are no longer able to provide a range of services. Because these services are not bought and sold in markets, this development is not directly visible through market mechanisms but may lead indirectly to increasing costs or decreasing outputs in related or dependent sectors. Specific mechanisms are needed to monitor both the level of stocks and their quality in terms of capacity to deliver both goods and services.

2.3. The natural resources "curse"

It is often suggested that natural resources are a curse rather than a benefit as a result of several unique factors:

- The finite nature of the non-renewable resources, which leaves producers vulnerable once stocks are depleted (*i.e.* natural resources are "dead end" sectors).
- The low growth potential of natural resource sectors, arising from the fact that they are "low tech" activities which do not stimulate productivity increases and a shift towards higher value-added products.
- Vulnerability to "boom and bust" cycles as a result of the volatility of commodity prices on international markets, which leaves exporters particularly vulnerable to external shocks (this applies to mineral resources, some renewable resources and a wide range of agricultural commodities).
- Vulnerability to the so-called "Dutch disease".

Each of these is addressed below.

2.3.1. Natural resources are a "dead end"

This argument must be qualified. While non-renewable natural resources are ultimately finite, this issue becomes relevant during the decades immediately prior to their total depletion. What is important is the quantity of known natural resource deposits that can be exploited profitably at current technology levels and expected long-term average prices. Moreover, technological progress in resource extraction often means that more can be extracted from existing reserves and new reserves become worth exploiting.

2.3.2. Natural resources are "low-tech"

This argument must also be qualified. Some natural resources require very high technology techniques (*e.g.* offshore oil) and/or call for increasingly advanced technologies as stocks become depleted. To the degree that one of the main economic explanations for a resource curse rests on the "low-tech" character of resource extraction, it is therefore doubtful whether there really is an inevitable economic resource curse. On the other hand, the "high-tech" or capital-intensive nature of extraction can itself lead to another problem, namely "enclave" types of economies around a particular deposit with few or no links with the local or national economy.

Poor economic performance in many natural resource-rich economies may have been caused not by resource abundance as such but by the weak institutions for resource management, structures of ownership and control, notably state-owned or state-controlled monopolies.

2.3.3. Vulnerability to "boom and bust" cycles

Compared to economies with diversified economic structures, resource-based economies are particularly exposed to large terms of trade shocks caused by sharp falls in the prices of their main export commodities. Good macroeconomic management and fiscal discipline cannot eliminate these risks but can significantly mitigate them. Conversely, fiscal irresponsibility, in any case, will tend to magnify, rather than smooth out, the effects of commodity price movements, contributing to "boom and bust" cycles.

2.3.4. Vulnerability to Dutch disease

The term "Dutch disease" is used to describe a situation in which a country suddenly discovers large quantities of natural resources and starts exporting them. However, Dutch disease can also become a pressing problem for a country if the weight of an existing resource sector in exports increases relatively fast. In either case, the increased resource wealth tends to raise the exchange rate and/or general wage levels, thereby putting pressure on the competitiveness of the other tradeable sectors in the economy.

Having a higher exchange rate is not all bad news, as it increases the purchasing power of the population (as imported goods become cheaper) and therefore raises living standards. The ensuing stronger consumption usually also boosts production in the non-tradeable sector. The drawback, however, is that the competitiveness of the non-resource based tradeable sectors comes under threat. To be able to continue exporting, or at least to withstand import competition, these sectors must therefore increase productivity sufficiently fast to keep their international competitiveness.

While productivity increases as such are obviously welcome, a potential problem is that the strong pressure from the appreciating exchange rate on the non-resource

tradeable sectors may ultimately affect employment levels. The resource sector usually provides relatively little employment itself. Therefore, if resource-based currency strength leads to a more capital- and less labour-intensive production pattern in other industrial sectors, it risks contributing to reductions in industrial employment.

This may not be a problem if growth in non-resource based activities is strong enough to create the necessary jobs. An expansion of the service sector, in particular, could compensate for lost industrial jobs, but a significant part of the potential employment opportunities in the service sector may be of rather low productivity, which would imply comparatively low wages. This could therefore give rise to social tensions, or, in countries where large wage inequality is socially and politically unacceptable, the service sector may fail to generate a significant part of potential employment.

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PART I

Chapter 3

The Economics of Sustainable Natural Resource Management

This chapter highlights the potential contribution of natural resources to incomes, employment, export and fiscal revenues. It provides an overview of policies and investments that can support pro-poor natural resource management and contribute to sustainable pro-poor economic growth.

3.1. Overview

There is a consensus that, over the long term, economic growth is an essential requirement and, frequently, the main contributing factor in reducing income poverty. Evidence across countries and time periods shows that long-term reduction in income poverty results first and foremost from growth. At the same time, developing countries with similar rates of economic growth have experienced quite different levels of economic poverty reduction, due to initial conditions (particularly levels of inequality in incomes and assets) and whether growth occurs in areas and sectors where the poor live and are economically active. The pattern and pace of growth are thus interlinked and need to be addressed together in order to have a substantial and sustained impact on poverty reduction (Box 3.1) (OECD, 2007).

To improve the impact of growth on poverty reduction, the flow of output (or income) from the assets of the poor has to increase and the poor have to increase their asset base, or gain from shifting between assets. Growth that is accompanied by degradation or conversion of natural capital on which the poor depend for their livelihoods (for example, the conversion of open access natural forests into privately-held plantations) may even aggravate poverty.

This chapter provides an overview of how natural resources contribute to sustained pro-poor growth. It focuses on the benefits of sound natural resource management in terms of production, employment creation, export revenues and fiscal resources. It also points to policies and investments which can support pro-poor natural resource management.

Box 3.1. **Pro-poor growth**

Pro-poor growth focuses attention on the extent to which poor women and men are able to participate in, contribute to and benefit from growth. This is measured by changes in the incomes of the households in which they live and the assets they and their children acquire to earn higher incomes in the future.

But when may growth be termed "pro-poor"? There are different views on this issue:

- For some, what matters is whether the incomes of the poor are rising *relative* to the incomes of the non-poor and hence inequality is falling. The merit of this perspective is that it focuses attention on whether the poor are benefiting more or less proportionately from growth and whether inequality, a key determinant of the extent to which future growth reduces poverty, is increasing or falling.
- For others, what matters most is the *absolute* rate at which the incomes of the poor are rising. For example, are they rising fast enough to reduce the number of people living below the international poverty line in accordance with MDG-1?

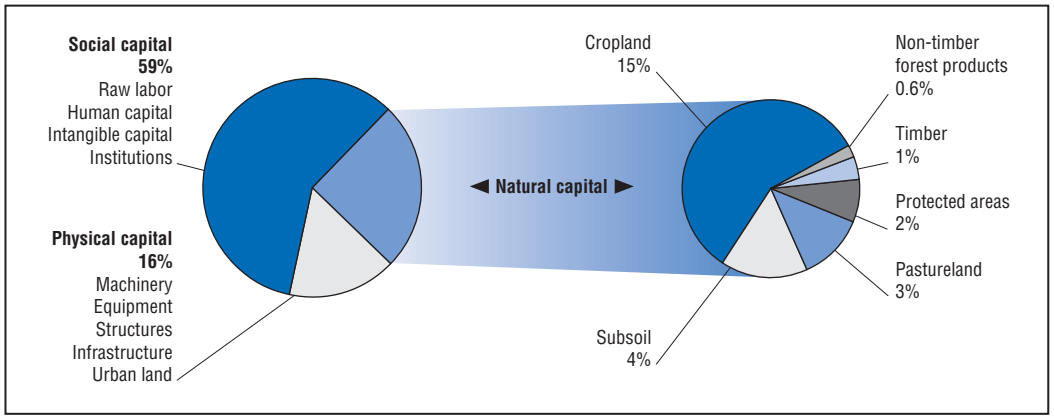
Source: OECD (2007), *Promoting Pro-poor Growth: Policy Guidance for Donors*, DAC Guidelines and Reference Series, OECD, Paris.

3.2. Natural capital contributes directly to incomes, employment and fiscal revenues

Natural resources underpin economic activities in many ways. Extractive resources, such as minerals, timber or fisheries, account for a large share of economic output in many countries. Soil and water resources are also fundamental to agricultural activities, a key part of the economy in many developing countries. Natural resources also act as an environmental host for goods, such as wild fruits, mushrooms, herbs, wild fish caught by small-scale fishermen, "bush meat", palm, timber and non-timber forest products which contribute to the subsistence of many people.

Natural capital is particularly important in developing countries. It is estimated to account for 26% of the total wealth in low-income countries (Figure 3.1), 13% of wealth in middle-income countries and only 2% of wealth in industrialised or OECD countries (World Bank, 2006b). Moreover, primary production represents a much higher share of production, exports and national income in developing countries compared with its share in industrialised countries. Natural resource-based enterprises thus provide important employment and income opportunities.

Figure 3.1. **Composition of total wealth in low-income countries**



Source: World Bank (2006b).

Forestry provides more than 10% of the GDP in many of the poorest countries. In all developing countries taken together, the forestry sector provides formal employment for 10 million people and informal employment for another 30 to 50 million people (Dubois, n.d.; ILO, n.d). In several developing countries, forests provided annual export revenues of over USD 100 million and more than 10% to 20% of export earnings (Lebedys, 2004). A quarter of the world's poor and over 90% of the people living in extreme poverty depend on forests for some part of their livelihoods.

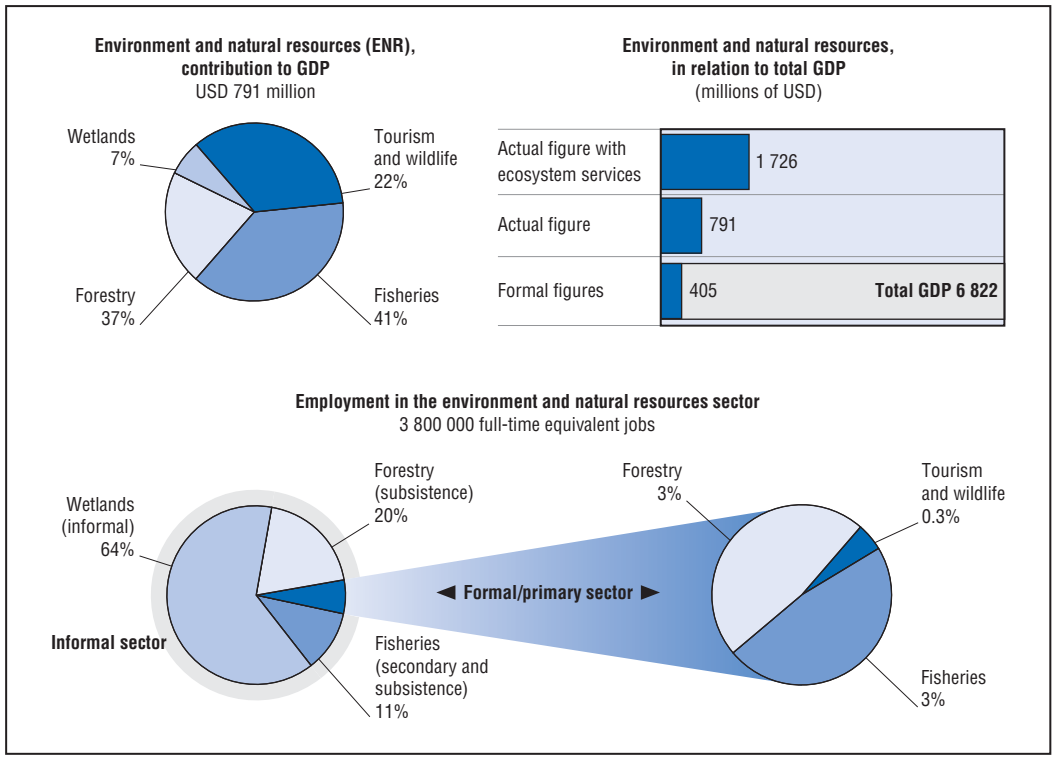
Fisheries account for between 10% and 30% of government budgets in several West African countries. Between 1993 and 1999 fishery access agreements provided 30% of the government revenue in Guinea Bissau, 15% in Mauritania, and 13% in Sao Tome. At the local level, in some areas fishery taxes provide a significant source of local revenue. Seafood exports from Africa into the European Union are worth over USD 1.75 billion and constitute the largest agricultural export product. For African least developed countries (LDCs), the seafood

trade was worth USD 570 million and, again, was the largest agricultural export product (FAO, 2007b; OECD, 2005).

Wildlife and nature-based tourism contributes significantly to the life of many poor people. An estimated 150 million people (one-eighth of the world's poorest) perceive wildlife to be an important livelihood asset. Nature-based tourism has high potential for pro-poor growth, being one of the fastest growing segments of the global tourist industry. Trophy-hunting generates significant incomes and public revenues in countries of eastern and southern Africa.

Figure 3.2 outlines the importance of natural resources in Uganda.

Figure 3.2. **Uganda: Quantifying the importance of environment and natural resources**



Note: It is estimated that the environment and natural resources sector should contribute USD 791 million to Uganda's GDP, excluding benefits such as ecosystem services. In the formal figures, where subsistence use and informal markets are not captured, only USD 405 million are recorded. Over 90% of the employment in the sector is secondary processing and subsistence use. Sustainable natural resource use implies that this sector will continue to provide vital non-agricultural rural employment for the poor. Conversely, unsustainable use will eliminate jobs from this sector.

Source: Moweni and Yaron (2004).

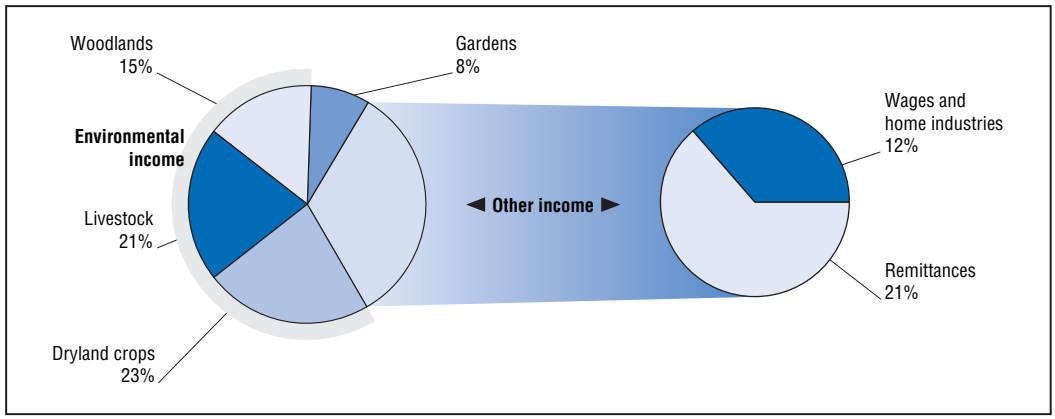
3.3. Natural resources underpin the livelihoods of many among the poorest

The poor are often highly dependent for their livelihoods on "common property" natural resources, which include fallow fields, forests, fishing grounds, pastureland and wetlands. These are a source of a variety of goods including food, fodder, building materials, fuel and medicinal plants among others, which are important sources of sustenance or income for many landless poor. In India, it has been estimated that common property resources provide poor households with about 12% of their income. In general the poorer the household, the more important is the income contribution through common

property resources. As a result, common property natural resources contribute to rural equity (Beck and Nesmith, 2001).

Some of the goods provided by natural resources are traded in formal markets and accounted for in national economic statistics. They include, for example, timber and fish harvested by formal-sector operators. But many are consumed directly by local inhabitants or are traded informally and/or illegally to avoid taxes and other regulations. As a result, they do not figure in official statistics. Figure 3.3 shows this in the case of Zimbabwe.

Figure 3.3. **Household income by source, Masvingo province, Zimbabwe**



Source: WRI (2005).

The forestry sector provides an example of the large share of informal activities and values which are not recorded in national accounts (Box 3.2).

Box 3.2. **Some examples of accounting for informal forestry activities in national income accounts**

In recent years, a number of countries have attempted to measure informal or non-monetary activities in their national income accounts. The following text presents some information from official reports, followed by comments on these figures (shown in italics) by Lebedys (2004). As the text shows, there is considerable variation in the way that informal forestry sector activities are handled in national income accounts.

Uganda: According to the government of Uganda, official statistics indicate that the forestry sector accounts for about 1.5% of GDP. For example, in 1999, the Ugandan Bureau of Statistics estimated that value added in forestry amounted to UGX 126 billion (Ugandan shillings), with UGX 64 billion generated in the formal sector and the remaining UGX 62 billion in the informal sector. In total, the sector accounted for about 1.5% of GDP.

A more recent review of the economic importance of the forestry sector in Uganda was produced as an unofficial report by the forestry administration. This estimated that more than 70% of wood consumption in Uganda is in the informal sector, which alone is valued at about 2.75% of GDP. Including the informal sector and a modest estimate of the value of environmental services provided by forests, the forestry sector accounts for about 6% of GDP. Major contributors to this are: domestic fuel wood – UGX 120 billion; charcoal production – UGX 70 billion; non-wood forest products – UGX 66 billion; commercial fuel wood – UGX 43 billion; and sawn timber – UGX 40 billion.

Box 3.2. **Some examples of accounting for informal forestry activities in national income accounts** *(cont.)*

*Current estimates of fuel wood production in Uganda are 33 million cubic metres (m^3) of fuel wood plus 0.7 million MT (metric tonnes) of charcoal (FAO, 2003). The exchange rate (in 2000) was UGX 1 512 to USD 1.00. Based on this information, the unofficial figures above would suggest that value added in fuel wood production is about USD 3.30 per m^3 (*i.e. *UGX 163 billion/33 million CUM = UGX 4 939 per m^3, or USD 3.30 per m^3). The value added per MT of charcoal production would amount to USD 66 per MT (*i.e. *UGX 70 billion/0.7 million MT = UGX 100 000 per MT or USD 66 per MT). These figures appear quite plausible, suggesting that the unofficial report may give a better indication of the importance of the sector than the official statistics in the national income accounts.*

Tanzania: In 2000, the official statistics for value added in forestry and hunting show a total of TZS 209 billion (Tanzanian shillings), with TZS 76 billion in the formal (monetary) sector and TZS 133 billion in the informal (non-monetary) sector. Together, these two sectors accounted for 3.1% of GDP (Bank of Tanzania).

*The current estimate of fuel wood production in Tanzania is 21 million m^3 (FAO, 2003), the exchange rate in 2000 was TZS 800 per USD 1.00 and average fuel wood prices are about TZS 3 000 per m^3. These figures would suggest that the gross value of fuel wood production in 2000 was TZS 63 billion (*i.e. *21 million m^3 x TZS 3 000 per m^3). Alternatively, taking the value-added figure for Uganda (USD 3.30 per m^3), value added in fuel wood production in Tanzania might amount to about TZS 55 billion (*i.e. *USD 3.30 per m^3 x TZS 800 per USD x 21 million m^3). Considering that fuel wood production might only account for about half of informal forestry activities and that hunting is also included in the official figures presented above, it appears that the official figures may be quite reasonable estimates.*

Philippines: The official estimate of gross value added in forestry and logging activities in 2000 is PHP 3.4 billion (Philippine pesos), amounting to 0.1% of GDP.

*Based on an exchange rate of PHP 44 per USD 1.00 in 2000, the figure above is equal to USD 77 million or USD 25 per m^3 of industrial roundwood production or USD 2 00 per m^3 of total roundwood production (FAO, 2003). However, according to REAP (2002), average fuel wood prices in the Philippines in 2000 were PHP 1.5 to PHP 2.2 per kg (equal to about USD 24 to USD 36 per m^3). Assuming that gross value added in fuel wood production is fairly close to the gross value of output (*i.e. *USD 24 to USD 36 per m^3) the gross value added from fuel wood production in the Philippines would be close to USD 1.2 billion (*i.e. *USD 30 per m^3 x 40 million m^3) or an additional 1.5% of the country's GDP. Even if a significant allowance were made for transport costs, this would suggest that the value added in the informal fuel wood production sector is substantially higher than the official estimate of value added in the sector.*

Source: Lebedys, A. (2004).

3.4. Natural resources provide a safety net in times of crisis

Natural resources provide vital supplementary income or food in times of crisis such as drought, in periods when employment opportunities are scarce, or when food stocks are low before the harvest. A study of the Mt. Elgon National Park in Uganda shows that environmental resources have played a safety net function during periods of natural and social disaster. Environmental income constitutes 19% of total revenue for peasants living near the park and poor households depend more on environmental incomes than wealthier households (OECD, 2006c).

3.5. Natural resources generate a wide range of positive externalities at the national and global levels

- *Local or national-level natural services* include, for example, the soil stability provided by upstream vegetation in a watershed, which contributes to the good functioning of downstream water supply, irrigation or hydro-electric facilities. Other examples include the pollination services provided by bees and other insects and recreation services provided by natural parks or reserves which underpin the nature-based tourism industry. Whether or not they are marketed and counted in GDP statistics, these services contribute to production, consumption and welfare. In some cases, they play a critical role in sustaining economic growth. Africa's dependence on hydro-electricity, which in turns depends on reliable water supplies, illustrates this (Box 3.3).

Box 3.3. **Importance of watersheds for urban electricity in Africa**

Urban electricity is crucial for industrial development and growing urbanisation. What is less known is that much of Africa's urban electricity is heavily dependent on water for hydro-electric power generation. For 26 sub-Saharan countries, hydro-electricity is the main power source, and for a further 13 countries is the second most important power source (Showers, 2002).

However, many of these economies are vulnerable to drought. When river flows are reduced, generating hydro-electricity becomes more difficult and the electricity supply, insecure. For example, Dar as Salaam, Tanzania's most economically important city, suffered frequently from power outages because of the drought in 2006. This has also been the case in Egypt, Cameroon, Ghana, Namibia, Nigeria, Zambia and other countries.

- *Global level externalities* include, in particular, genetic information for biotechnology from biodiversity and the sequestration of CO_2 by forests, which helps contain climate change. These are two clear examples which benefit all countries but not necessarily the nation hosting the forest. Extensive literature exists on the economic impact and costs of climate change and adaptation and the topic is therefore not covered here (but see Box 1.1 above on the negative impacts of climate change).
- *Natural resource extraction can also generate negative externalities*. The degradation of natural services undermines human welfare and often necessitates costly remedial actions. Many extractive activities, such as mining or commercial-scale logging, generate a host of negative externalities which must be mitigated. The impact of these external costs, in the form of harmful water and air pollution and of soil erosion, often falls disproportionately on the poorest.

3.6. Sustainable natural resource management raises unique challenges

3.6.1. *Minimising the impact of "boom and bust" cycles*[1]

As noted in Chapter 2, countries which are heavily reliant on natural resources are vulnerable to "boom and bust" cycles. This problem can be addressed through various policies.

The creation of a stabilisation fund is one important policy response. It typically aims to reduce the impact of volatile revenue on the government and the economy, to save for

future generations, or both. It accumulates windfall government revenues which would ideally be managed by an entity that has no authority to spend the money (that is, an independent special institution or the central bank, but not the government, the ministry of finance, or any other ministry). The rules for when, and which, revenues should be accumulated and when they may be spent should be very strict and transparent. The accumulated revenues should primarily be invested in safe and liquid foreign currency-denominated assets, if domestic financial markets are very thin. But consideration should also be given to investing part of these resources in selected domestic assets, as these resources can support the strengthening and deepening of local financial markets. However, this approach implies that any increase in natural resource price and associated revenues would not contribute to pro-poor growth in the short term, if revenues are saved for the future. Their use is limited to preventing a slowdown or loss of pro-poor growth in later periods when prices are lower.

An alternative policy option is the use of windfall revenues to fund public investments (*e.g.* in infrastructure) that raise the productivity of private investment, not only in non-traded sectors but also in traded sectors. Over time this can reduce the dependency on natural resources and contribute to pro-poor growth often faster than stabilisation funds.

A counter-cyclical fiscal policy with respect to commodity prices is another possible policy response. It requires keeping the budget on a sustainable fiscal path across the commodity price cycle while avoiding fluctuations in pro-poor spending. Moreover, fiscal policy should always be based on conservative price assumptions for the major export commodities. If budgetary commodity price assumptions are above long-term averages, or if revenue assumptions implicitly take above-average prices for granted, then budgets should be drafted to achieve corresponding surpluses. In this respect it must be clear that a budget that balances thanks only to exceptionally high commodity prices is not in balance at all.

Export diversification is another way to minimise the impact of "boom and bust" cycles, but is a rather long-term process. Initiatives such as commodity risk management instruments and specific programmes for fostering the development of new export sectors can help governments to withstand external shocks and sustain their diversification strategies.

Keeping external debt (whether public or private) at a sustainable level also helps in reducing external vulnerability, both by decreasing the risk of currency crises and by limiting the damage from such crises if they do occur. Resource-based economies also need a significant degree of exchange-rate flexibility in order to be able to accommodate shifts in their terms of trade. When commodity prices are rising, the problem is that currencies may become fundamentally overvalued, bringing the risk of especially large and painful exchange-rate depreciations as and when those prices fall. Hence there may be a place for efforts to avoid excessive exchange-rate appreciation, especially when the prices of major export commodities are high and there are large short-term capital inflows. Nonetheless, pursuing such exchange-rate goals may be costly in terms of inflation unless there is the political will for sufficient fiscal sterilisation. This reinforces the need for resource-based economies to have a stabilisation fund, but it also implies that their central banks need an especially large capacity for monetary sterilisation.

3.6.2. Avoiding the "Dutch disease"[1]

The potential negative impact of the natural resource sector on the economy (the Dutch disease referred to in Chapter 2) can be mitigated by the right policies. Specific public investments funded by windfall revenues, export diversification and the tax system can all be instrumental in avoiding Dutch disease and in assisting the development of the non-resource sector. If the tax system is used for impact mitigation, direct taxation of the natural resource sector should be increased, though it must be assured that these sectors, which are often critical to growth, remain sufficiently profitable to allow for their further development. The proceeds of the increased resource taxes should then be used to lower overall tax levels in the economy and, in particular, to cut non-wage labour costs. While lower non-wage costs might be – in certain sectors – wholly or partially offset by wage increases, they should at least lead to lower total labour costs in sectors with low productivity.

While orienting the tax system towards the resource sector can help to alleviate Dutch disease, it also increases the dependence of the budget on commodity prices. This underlines the importance of having a sufficiently large stabilisation fund and/or complementing this policy with measures that help generate alternative public revenues, such as selected public investments that contribute to increase the productivity of the national economy.

3.6.3. Getting prices right

Clearly defined access rights may limit the overuse and degradation of renewable natural resources and allow for better resource use. Taxes and user fees may also be used to improve resource management, but often other instruments are needed such as zoning, permits or labelling systems. These instruments are specific to the natural resource sector concerned and are discussed in Chapters 6 to 12.

3.6.4. Tackling the "absent market" challenge: Payments for environmental services

Some of the intangible environmental services provided by natural resources can be paid for through specially-designed market mechanisms. For example, admission fees to parks – national or private – could cover the costs of maintaining them. In many countries, for example, bee-keepers are compensated by fruit growers. Other services such as water filtration or the regulation of water cycles are much more difficult to measure, and to charge for. The beneficiaries of such services are also many, diverse and difficult to identify. Charging for such services requires mechanisms which are difficult to establish.

"Payment for environmental services" (PES) schemes have generated considerable interest in recent years. PES are used to finance conservation, watershed protection (Box 3.4) or carbon sequestration (Landell-Mills and Porras, 2002; Pagiola, Bishop and Landell-Mills, 2002). They may contribute to reducing poverty mainly by making payments to poor natural resource managers. However, the evidence on the pro-poor nature of PES schemes is still limited. It is in many cases too early to arrive at conclusive results on the likely results of PES programmes (Pagiola, Arcenas and Platais, 2005). This issue is therefore not covered further here.

Box 3.4. **Payment for watershed preservation services**

In Colombia, self-organised private deals and public payment schemes are being used to improve forest management, reforestation activities and development of watershed communities.

In Costa Rica, private upstream owners of forestland are being compensated by private hydro-electric utilities, the government of Costa Rica and a local NGO. New York City has set up an elaborate watershed management scheme which includes compensating upstream private landowners for adopting watershed-friendly land uses, in addition to regulatory measures and the purchase of particularly ecologically sensitive land. In all such schemes, assessing the level of the payments to be made and verifying compliance are key challenges.

3.6.5. Selecting from a range of possible sustainable exploitation equilibria

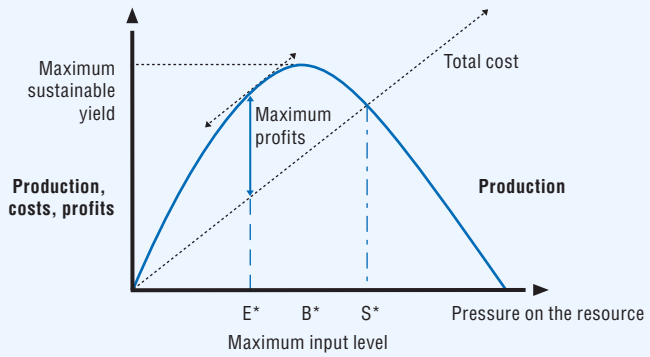
In the case of renewable resources, a key challenge is to ensure that extraction rates do not exceed the capacity for regeneration, in other words to ensure sustainable exploitation. In many cases, however, there are multiple sustainable equilibrium rates of extraction. There will often be a trade-off between the objective of maximising the economic value of resource extraction and those of maximising other benefits such as associated employment opportunities or (in the case of fisheries) maximising food production (Box 3.5). For a discussion of the distributional implications of these policy choices, see section 4.2.2.

Box 3.5. **Political priorities on the management of natural resources determine the optimal rate of exploitation**

This figure depicts the trade-offs between three typical situations of renewable natural resource management (RNRM): *i)* the maximization of financial rents (economic optimum: E*); *ii)* the maximisation of production (biological optimum B*, or maximum sustainable yield MSY) that can be preferred if the priority consists in food security or in exports (for example); and *iii)* a situation of weak profits but with maximal number of resource harvesters (S*) which can be preferred if the priority relates to employment (for example). Hence, depending on the political priorities, each situation can be regarded as optimal.

RNRM: Three typical situations

Each one may be regarded as optimal



Source: Wertz-Kanounnikoff and Rojat (2007).

3.7. Converting natural resources into other forms of capital: Some key issues

3.7.1. There is often scope for converting natural resources into other forms of capital

Liquidating natural capital (*e.g.* by exploiting a fishing ground to exhaustion) and consuming the proceeds clearly reduces the total amount of capital available to an economy and is not profitable over the long term.

However, there is generally scope for converting one form of capital into another. Converting natural capital into human and man-made capital can be a way to increase the total output if this conversion is towards more productive forms of capital. "Wild" natural capital can be substituted with "produced" natural capital, for example when a forest is converted into a tree plantation, pastureland or agricultural land or a mangrove is converted into a fishpond. Similarly proceeds from the extraction of resources such as minerals – which are non-renewable anyway – can be used to finance investments in, for example, infrastructure, education or health.

3.7.2. But certain conditions must be met

For conversion of natural capital into other forms to be economically beneficial in the long term, certain conditions must be met. One approach, known as "weak sustainability",[2] requires that the combined value of all forms of capital should remain constant or on the increase. A growth path which obeys this principle when the stock of natural resources is reduced is often said to follow "Hartwick's rule" (Box 3.6). It requires that a nation invests all rents earned from exhaustible resource extraction. This has been the process followed in many industrialised countries, and in a number of middle-income countries such as Indonesia and Malaysia.

Box 3.6. **Hartwick's rule and Hotelling's rule**

In resource economics, **Hartwick's rule** defines, under certain conditions, the amount of investment in produced capital (buildings, roads, knowledge stocks, etc.) that is needed to exactly offset declining stocks of non-renewable resources. This investment is undertaken so that the standards of living do not fall as society moves into the indefinite future. Hartwick's rule – often abbreviated as "invest resource rents" – requires that a nation invest all rent earned from exhaustible resource extraction, where rent is defined in a particular way. The rule extends to the case of many types of capital goods, including a vector of stocks of natural capital. Hartwick's rule is a special case of **Hotelling's rule**, which defines the optimal profile of resource extraction given an exogenous rate of time preference (*i.e.* a marginal rate of intertemporal substitution); intertemporal equilibrium ensures an efficient substitution between exhaustible resource stock and investment in produced capital.

The "genuine saving" approach provides a way to estimate how countries are managing to maintain or increase their total stock of capital (Box 3.7).

3.7.3. The decision to convert natural capital must take account of a wide range of factors

For the conversion of natural capital into other forms to be beneficial overall, the present value of the flow of goods and services provided by the capital to be converted must be less than that yielded by the alternative form of capital. The factors to consider when assessing the likely merit of converting natural capital into another type of capital vary with different types of resources.

In the case of *metals, minerals and fossil fuels*, which are non-renewable and exhaustible, the main issues to consider are *i)* the optimal rate of exploitation, which will be guided by the open *Hotelling rule* (Box 3.6); *ii)* the appropriate share of the proceeds to be invested in human, financial or physical capital in order to keep total capital levels growing or constant; and iii) how to mitigate or compensate for the negative externalities such as pollution which are generated in the course of extraction.

Box 3.7. **Genuine net saving: An indicator to assess overall capital stock**

One way to assess (*ex post*) whether the conversion of natural resources into other forms of capital has kept constant or increased the overall capital stock is to look at "genuine saving". Genuine (or adjusted net) saving measures the true level of saving in a country after depreciation of produced capital. Investments in human capital (as measured by education expenditures); depletion of minerals, energy, and forests; and damage from local and global air pollutants are taken into account. It does not, however, take into account fish stocks depletion and subsoil water, because of a lack of data. Positive genuine saving implies that wealth from all forms of capital is increasing. Negative genuine savings indicate that total wealth is in decline.

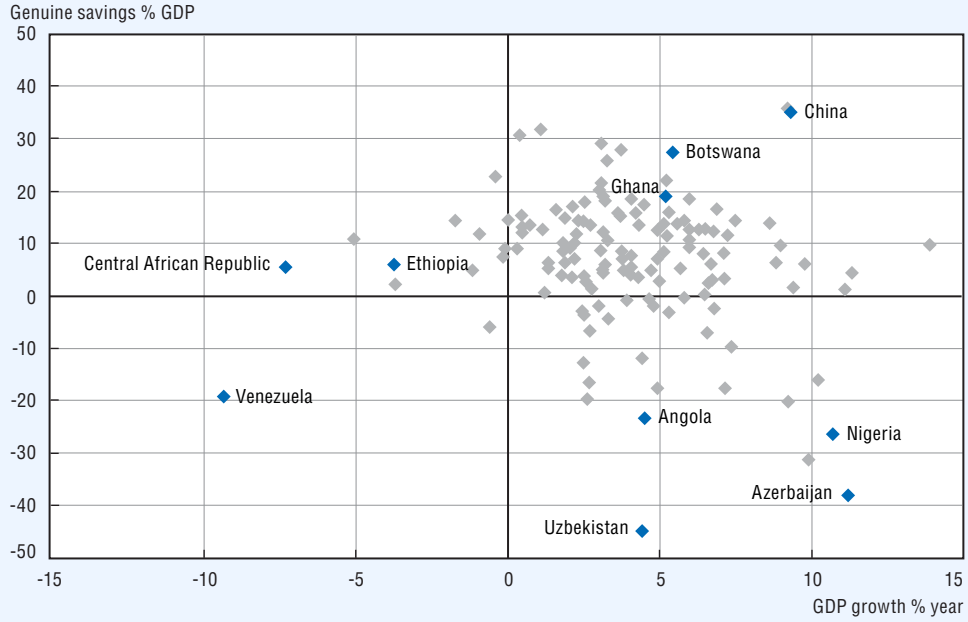
The figure below scatters genuine saving rates (as percentage of GDP) against GDP growth. Countries in the top right quadrant have positive GDP growth rates and genuine saving rates. These countries' economies are growing and, according to the genuine saving measure, not at the expense of future generations. This points to a positive future for countries like China, Ghana and Botswana, all of which have strong economic growth and positive genuine saving rates, although a more complete measure taking into account pollution damage and soil degradation would show a more muted performance.

Countries in the top left-hand quadrant are experiencing contracting economies with declining GDP. Lower levels of economic growth today imply falling living standards. However, these countries have positive genuine saving rates, implying they are investing for the future. The forecast for a sustainable economy is, therefore, a possibility.

A preliminary glance at the traditional indicators of economic growth suggests that those countries in the bottom right-hand corner of the figure below are doing well, as economic growth is positive and their economies are growing. However, when the genuine savings calculation is considered, this optimistic picture needs more consideration. Countries such as Nigeria, Angola, Uzbekistan and Azerbaijan all have growing economies, but possibly at the expense of future generations' welfare, as their genuine saving rates are negative. This highlights the importance of considering other indicators in addition to economic growth to forecast the sustainable growth of a country.

Box 3.7. **Genuine net saving: An indicator to assess overall capital stock** *(cont.)*

Genuine savings rates against economic growth (2003 data)



Source: World Bank (2006b).

In the case of renewable resources, such as fisheries and many types of forests, where there is scope for continued exploitation at economically profitable levels, a decision to deplete and eventually liquidate the stock completely must be based on a careful calculation of all the associated costs and benefits. In addition to the opportunity cost of continued sustainable extraction, this calculation must factor in the wide range of environmental services provided by natural systems.

In such cases the decision whether to convert natural capital into other forms must be based on a comprehensive assessment of the balance of benefits and costs. This will entail estimating the value of non-market goods and services for which there will not be readily observable prices. The Millennium Ecosystem Assessment, which has examined these issues in depth, has stressed the costs of this conversion process in terms of the forgone ecosystem benefits, and noted that many ecosystem conversions have failed to provide the hoped-for benefits.

3.7.4. There can be difficult trade-offs between different interest groups

There will often be differing perceptions of trade-offs at the regional, national level and local levels. For example, a forest may provide essential services to a region in terms of watershed protection whereas local inhabitants would earn more by converting it to, say, agriculture. Conversely, the conversion of a natural forest into a plantation may generate economic benefits and jobs but undermine the livelihoods of local communities. A detailed distributional analysis is needed to ensure that the poor are not left worse off after conversion than before, even when others gain. Similarly, large-scale biofuel development raises concerns over rising food prices, deforestation and competition over land. Such

trade-offs can only be resolved through national and local-level political processes and backed by reliable information.[3]

3.7.5. Critical thresholds can be reached

There are limits to the degree to which natural capital can be substituted by produced assets such as physical and human capital. Beyond a certain point, the maintenance of remaining natural capital becomes critical. This happens when the life-supporting ecosystem services provided by natural capital are irreplaceable or can only be replaced at very high cost. Services such as water filtration, regulation of water cycles or the provision of habitats for spawning could in principle be provided artificially (by physical or biochemical processes) but are provided much more cheaply by natural ecosystems. In many such cases, the value of alternate land use is actually low or zero.

For example, a forest in steeply-sloping terrain is likely to be the optimal use of this particular piece of land, given that it cannot readily be converted to agriculture. In economic terms, the opportunity cost of maintaining critical capital is low or negative. Given the right set of regulations, access rights regimes and incentives, it may be possible to combine production of the goods provided by the forest (*e.g.* timber extracted in a sustainable way) as well as non-marketed services such as watershed protection. Conversely, exploiting this forest to exhaustion would entail its irreversible loss, with few, if any, compensating benefits.

This has given rise to the concept of "critical natural capital" beyond which there should be no further substitution. Some countries have discovered this the hard way and are having to devote significant resources to restoring critical natural capital at a cost much higher than preventing its degradation.

3.7.6. In some cases, natural capital may become an indispensable complement to existing human and other capital, not a substitute[4]

The scope for converting natural capital into other forms of capital may in some cases be minimal or zero where existing human capital is very specifically linked to available natural capital. Subsistence farmers, for example, may have very specialised knowledge and skills which are only applicable to their current activity. Where natural capital is so severely degraded that it can no longer be used, considerable human capital is lost as well.

For example, if farmers abandon agricultural production as a result of collapsing soil fertility and start working as unskilled labour in a non-agricultural sector, both the natural capital and the associated human capital (specialised knowledge and skills related to their farming background) are lost.

In such cases, preventing the collapse of remaining natural capital through appropriate measures and investments yields high economic returns, as it preserves both natural and associated human capital.

3.7.7. Conversion of natural capital often results from neglect rather than rational decision making

In practice many natural resources are exhausted or converted to inferior uses not as a result of a rational decisions based on a careful assessment of potential benefits and costs but as the consequence of a set of policy, regulatory and enforcement failures which lead to the uncontrolled exploitation and irreversible exhaustion of natural capital.

This is clearly not economically or socially desirable. Moreover, many opportunities for investments which could foster economically profitable management in sectors such as

fishery and forestry are missed. These issues are further addressed below and in the sections on forestry and fisheries.

3.8. Natural resource management in support of pro-poor growth: Key approaches

3.8.1. *Protecting and expanding the natural capital available to the poor*

Protecting and expanding the natural resources which are of particular importance to the poor is therefore an important way to support pro-poor growth. A first step is to ensure that open access to natural resources on which the poor depend is not *de facto* privatised by elite groups. Such unwanted privatisation may occur in particular when traditional systems of regulation on common property use that worked in the past have broken down – partly due to population pressure as well as to other factors. It can also happen when public resources (for example forests) are leased out to commercial-scale operators under concession agreements which grant exclusive access, driving out the poor. The problem of state capture by the elite through corruption and political patronage is more prevalent in remote areas, far from official concern and public scrutiny, which are precisely those areas inhabited by the poor.

Box 3.8. **Natural resources and the poor in India and Uganda**

Loss of forest access among the poorest in India: Can it be prevented?

In western and southern India, privatisation of land has created a reduction of up to 25% or 50% in the area of common property resource lands. The national forest policy of 1998 recognises this: "The life of tribals and the other poor living within or near forests, revolves around forests. The rights and concessions enjoyed by them should be fully protected. Their domestic requirements for fuel wood, fodder, minor forest products and construction timber should be the first priority. Similar consideration should be given to scheduled castes and other poor living near the forests." However, implementation of this policy is fraught with difficulties.

In Uganda, access to natural resources is a key determinant of incomes

For rural households in Uganda, the key variable explaining income levels was access to land and livestock. In villages near Lake Victoria, the key variable explaining income was access to fishing boats and gear. These have been found to be more important in determining income than other variables such as access to education. Success in one activity enables success in another, and so fishing income may be used for land and livestock investments.

Source: Ellis and Bahiigwa (2003), Jodha (1990).

Addressing these issues may require reforming existing access or use rights, strengthening enforcement or both. Changes in the fiscal treatment of property, for example by penalising owners who keep land idle, can also help increase the natural capital available to the poor and ensure that all available land is put to use.

There will be difficult trade-offs to resolve where communities or small and medium-sized enterprises compete for the same resources with more efficient large-scale enterprises. In such situations, a balance will have to be struck between the objective of maximising the total value of production and that of creating job opportunities for the poor. The fisheries sector provides a clear example of such a trade-off: export-oriented

large-scale fishing boats are more efficient and generate more economic value than their self-employed, small-scale counterparts, but also much less labour-intensive. Similarly, commercial-scale forest extraction is often more efficient in terms of maximising economic value than community-level extraction.

3.8.2. Maximise the productivity of existing natural capital through complementary public investments

Most types of natural capital require complementary investments to generate growth effectively. Many such investments are unlikely to be financed by the private sector and require public support. Examples include physical infrastructure such as irrigation facilities which can sharply increase agricultural productivity, and transport infrastructure, which can provide access to markets and inputs. Similarly, the provision of training and extension can foster efficient land or water management, the uptake of new technologies and crops, etc. Improved access to credit is an important complement.

In many cases, improved access to market and credit is necessary for farmers to switch from low-productivity subsistence food crops (*e.g.* rain-fed corn), to higher value tree crops (fruit crops, cashew nuts and similar), which are far more desirable from both economic and environmental perspectives.

In the case of fisheries, improved landing facilities and access to refrigeration and transport can sharply increase market value of the fish catch. In the case of agricultural products, access to processing facilities (*e.g.* storage, drying) reduces post-harvest loss and increases the price obtained for the products. Nature-based tourism may require advertising campaigns in target markets at a cost far beyond the reach of individual operators while benefiting the entire tourism sector of a country. Improved access to modern energy can often facilitate value-adding processing industries based on natural resources (*e.g.* handicrafts, furniture and so on).

In many cases modest but strategically selected public investments which greatly increase the productivity of natural resources yield high rates of return.[5] Targeting such investments at particularly poor areas or at activities of particular importance to the poorest will support pro-poor outcomes. There may, however, be trade-offs. Achieving a proper balance between the most profitable investments and those with the most pro-poor benefits will require a political decision.

3.8.3. Ensure that access and use rights and regulations result in proper pricing of resources

The efficiency of using natural resources is heavily influenced by regulations regarding rights of access and use. Different types of resources call for different types of regimes. A general rule, however, concerns the need to avoid "open access" situations by attributing clear access and use rights at the right level. These range from community-level rights to private property rights. Established rights must also be enforced. These issues are discussed in more detail in sector-specific chapters below.

The pricing of access or use rights to the resource is another important policy instrument affecting efficiency of production. When water prices do not reflect the actual cost of provision, farmers use far more than they need for a given harvest, water-intensive crops are grown in water-short regions, and irrigation works are not kept in good working order.

Subsidisation of resource extraction generally promotes wasteful use. By artificially depressing the prices of natural resources, subsidies remove the incentive for efficient use of

resources by industries that process the resources or use them as an input, or by consumers. Subsidies are often indirect. In the case of forestry, for example, log export bans or support for investment in processing capacity (in the name of stimulating value-adding processing) can act as *de facto* subsidies for domestic wood industries, even if timber extraction itself is not subsidised. Economic analysis and case studies of Malaysia, Ghana and Indonesia suggest that the main effect of logging bans has been to encourage overcapacity and maintain inefficiency in the wood-processing industry, both of which increase the pressure on forests (Porter, 2002). (See Chapter 7 for more detailed coverage of these issues.)

Other critical factors include, in particular in the case of renewable resources, regulations regarding harvesting techniques and equipment. The objective is to minimise damage to the resource in the course of harvesting.

In the *forestry* sector, that implies ensuring that harvesting does not destroy immature trees which can then be harvested in subsequent rounds. Support for the application of "reduced impact logging" techniques is particularly relevant in this regard. For *fisheries,* the aims include avoiding techniques which lead to high rates of by-catch or catches of undersized fish. Some forms of industrial-scale fishing lead to high rates of wastage. Up to 80% of the fish catch is discarded because it is commercially useless and was not the intended target of the fishing nets. Such catch methods may be privately profitable, but socially inefficient, as individual fish catchers do not have incentives to care about fish stock regrowth (which benefits all users).

In some countries, even subsistence-scale natural extraction activities (*e.g.* timber extraction, fishing and marketing, grazing, agriculture and water use) are heavily taxed and regulated. For example, taxes on subsistence fish extraction, production and distribution are levied in many countries. Around Lake Chad in central Africa, fishery fees are levied by traditional authorities, the central government and by soldiers (Béné, 2003; Béné and Neiland, 2003). Streamlining fiscal and regulatory regimes will directly increase the benefits to the poor, notably by allowing them to engage in formal marketing activities and improve the returns from their convenient access to natural resources. It must be noted, however, that natural resource taxation is also often informal (*i.e.* bribes) and may be equivalent to rent capture by local officials for private gain.

3.8.4. Maximise the commercial value of the resource extracted by raising product quality

Improved transport, communications and financial services can improve access to markets. Beyond this, there are many other ways to increase the commercial value of natural resource-based products. Provided access and use rights are well defined and enforced, this can help sustain the resource base by increasing revenues from resource extraction and raising the opportunity cost of their degradation.

Relatively simple processing activities, such as fruit-drying or improved product standardisation and packaging, can greatly increase product value and expand the range of marketing opportunities, notably in export markets.

Securing access to export markets often requires an ability to meet rigorous standards and requirements, such as health, sanitary and safety standards for fish, fruit and other products. Investment in the human and technical capacity to meet such standards can pay off through higher prices. Focusing such efforts on the products which can be produced by the poor (*i.e.* which can be produced by small-scale operators with limited equipment

Box 3.9. **Rising shrimp prices in Madagascar**

The shrimp industry – both wild and farmed – is an important industry in Madagascar, earning over USD 155 million a year in export revenues. Recent efforts by the private sector and the government to improve the industry have led to significantly rising prices. Export prices increased by 10% over 2000/1 and 3% over 2001/2. This price rise occurred as the result of a larger shrimp size obtained by controls on overfishing, and improved access to market and other information through an economic observatory.

Source: Rojat, Rojaosafara and Chaboud (2004).

requirements and limited know-how) enhances income opportunities for the poor. Relevant products may include natural food products (*e.g.* dried fish, honey) as well as handicrafts (wood products and basketry).

Voluntary product standards associated with "eco-labels" or "fair-trade" labels are also increasingly important. The growing sale of, for example, fair trade coffee, Forest Stewardship Council wood products and Marine Stewardship Council fishery products, as well as of products certified as "organic" (which include foods, cotton and others), indicates a growing consumer demand for products which meet social and environmental standards. Initially confined to "niche" markets, these products are increasingly mainstreamed and distributed in supermarkets.

Box 3.10. **Growing demand for "fair trade" and environmentally certified products**

The "FAIRTRADE" mark is a certification label awarded to products sourced from developing countries that meet internationally recognised standards of "fair trade". By participating in fair trade, producers are able to use the additional income to strengthen their organisations and invest in social, environmental and business improvements.

In 2006, consumers worldwide bought Fairtrade Certified Products worth more than EUR 1.6 billion, 42% more than the year before. For products such as coffee and cocoa, the growth was particularly impressive, 53% and 93% respectively (FLO 2007). There are now over 2 500 certified Fairtrade product lines available, according to the Fairtrade Foundation (2006).

Larger companies are embracing fair trade. To quote Marks and Spencer: *We know from our own research that shoppers want to be able to buy more fair trade products, made or grown by farmers in developing countries who are guaranteed a fair price for their goods.* (*www2.marksandspencer.com/thecompany/trustyour_mands/fairtrade.shtml*).

Sainsbury's, the UK's second largest food retailer, announced in December 2006 its commitment to source all of its bananas (amounting to 2 000 tonnes or about 10 million bananas per week) from certified fair trade resources (Fairtrade Foundation, 2006). In the USA, McDonalds announced in November 2006 that it would sell only fair trade certified coffee in 658 of its restaurants across the northeast (Olsen, 2007). Starbucks is another major purchaser of Fair trade-certified coffee.

Similar approaches exist with respect to wood and fish products. For example IKEA has banned the use of timber from intact natural forests, except those forests that have been certified by the Forest Stewardship Council (FSC). In the USA, Wal-Mart has been working with WWF and Conservation International to support supply fisheries that are embracing sustainable practices and helping them move towards Marine Stewardship Council (MSC) assessment.

3.8.5. Channel fiscal revenue from natural resource extraction towards pro-poor investments

Some countries have successfully used their natural resource wealth to stimulate growth for poverty reduction. They have done this by levying taxes on the extraction of natural resources and channelling the proceeds to poverty-reducing investments. This can include earmarking certain natural resource revenues for marginalised groups – often those living near the resources themselves.

3.8.6. Promoting a shift from natural resource extraction towards more value adding activities?[6]

Developing a successful modern economy based on natural resource exports is, in principle, feasible, given the right institutions and policies, as the examples of OECD countries such as Canada, Australia or the Scandinavian nations demonstrate. However, there are risks associated with being highly dependent on a limited number of resource-based sectors and a more diversified economic structure is something that in principle is desirable.

It will be important not to lose sight of what diversification policies can and cannot achieve. First, it must be clear that there is no miracle recipe to achieve diversification overnight. Fostering diversification will be a long drawn out process, and should hence be seen as a long-term goal. Second, there is no shortage of examples of failed diversification policies, and economists know fairly well on the basis of international experience what does *not* work.

Fiscal irresponsibility as well as large-scale state investment in pet industrial projects rank at the top of the list of what should be avoided. Unfortunately, there is less agreement among economists about what *does* work, as policies that work well in one place often fail dramatically elsewhere. Indeed, failures have been so common (and sometimes so spectacular) that, in recent years, economists have often preferred not to give any advice at all with respect to diversification policies.

Nevertheless, there are some policies that are helpful in fostering diversification and that should be fairly uncontroversial. Broadly speaking, they consist of getting framework conditions for entrepreneurship right, making sure that the business environment is generally competitive and that there are sufficient incentives to invest in non-resource sectors. As such, they involve a large number of structural reforms typically advocated by mainstream economics.

The most obvious conventional measure is to use the tax system to assist the development of the non-resource sector. The types of tax policies required are similar to the ones needed to combat the Dutch disease. The guiding principle should be to make extensive use of taxes that specifically target the resource sectors, which in turn allows low general tax rates.

In addition to tax policy, there is also a long list of structural reforms, including financial sector and administrative reform, which would be particularly important for facilitating the diversification of economic activity. Mechanisms for efficiently allocating investment resources across – and not merely within – economic sectors are important.

Setting up framework conditions to allow the banking sector to develop – while making sure that it remains in good health – is thus a key priority.[7] At the same time, there often is a crucial need to improve basic framework conditions for business, particularly

small and medium enterprises (SMEs). In many resource-based economies, there is large scope to reduce the burdens imposed by heavy regulation and an often corrupt bureaucracy, which in addition to strengthening the financial system, would help to create a more level playing field and decrease barriers to entry.

However, reasonable doubts have been voiced as to whether these policies would prove sufficient to achieve the stated goal of diversification in a reasonable time span.

3.8.7. "New style" interventions

While acknowledging the need for good framework conditions for business as a *sine qua non*, some economists advocate the pursuit of "new style" industrial policies as a supplement to the structural reform agenda. "New-style" interventions[8] recommend the creation of programmes directly to improve the productivity and competitiveness of selected enterprises, which would to some degree serve as an example for other entrepreneurs. The guiding features of such policies usually include that they be highly transparent, that participation in these programmes be determined by private sector representatives, and that the period during which any single enterprise can participate in such a programme be strictly limited.

Programmes should not involve significant transfers of resources to participating enterprises, but rather focus on the transfer of knowledge or skills, such as new production, management or marketing techniques, or the dissemination of specific information (*e.g.* about potential export markets). An extensive discussion of "new style" industrial policy can for example be found in Drebentsov (2004).

Notes

1. This section draws from Ahrend (2006).
2. Strong sustainability is based on the concept that natural capital is a complement to manufactured capital rather than a substitute.
3. The tradeoffs between local and global-levels benefits (*e.g.* carbon capture, biodiversity conservation) are even more difficult to address. They can only be addressed through international co-operation and financing those global benefits derived from a country's actions. This is the objective of the Global Environment Facility (GEF), and of international agreements to deal with such issues, including the Kyoto Protocol.
4. This section has drawn on the work of Giraud and Loyer (2006) "Natural Capital and Sustainable Development in Africa", Agence Française de Développement, Working Paper 33.
5. For a more in-depth discussion of rates of return to environmental investments see Pearce (2005).
6. This section draws from Ahrend (2006).
7. Developing a sound banking sector is complicated by resource dependence, as it makes it more difficult for banks to achieve sufficient sectoral diversification of their loan portfolios.
8. For a theoretical foundation of "new style" industrial policy and a survey of various international experiences in this field see also Rodrik (2004).

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PART I

Chapter 4

Politics of Natural Resources

"As we progressively understood the causes of environmental degradation, we saw the need for good governance. Indeed, the state of any country's environment is a reflection of the kind of governance in place, and without good governance there can be no peace. Many countries, which have poor governance systems, are also likely to have conflicts and poor laws protecting the environment." Wangari Maathai, President, Greenbelt Movement, Kenya; Nobel Prize Winner.[1]

Previous chapters have provided an overview of the actual and potential contribution of natural resources to pro-poor growth. As in most cases, governance-related factors, notably those related to control over resources, play a key role in constraining or supporting the contribution of natural resource management to pro-poor growth. This chapter focuses on the political and governance dimensions of pro-poor natural resource management and growth.

Politics is here defined as the way that societies choose different policies to achieve their desired outcomes. The concept of governance is somewhat broader and includes all the rules and enforcement mechanisms that guide and coordinate people's behaviour with regard to a concerted outcome. This includes intended as well as unintended processes.

The politics of natural resource management are typically located in a stress field, where policy makers have to balance a wide range of competing objectives. For example, increasing growth and empowering poor people socially have often been regarded as two disparate and competing goals. Yet there is often a wide range of policy options that does reconcile these seemingly opposed objectives.

An analysis of the governance dimensions of natural resource management can help clarify governance mechanisms and identify policy options that support multiple objectives. A better understanding of governance mechanisms is a precondition for the successful implementation of policies that foster pro-poor growth while managing natural resources in a sustainable way.

4.1. Key factors for natural resource management

Three types of factors can be distinguished which shape the management of natural resources and governance-related arrangements: first, the characteristics of natural resources; second, the actors involved; and third, the institutional framing and rules (FAO, 1997).

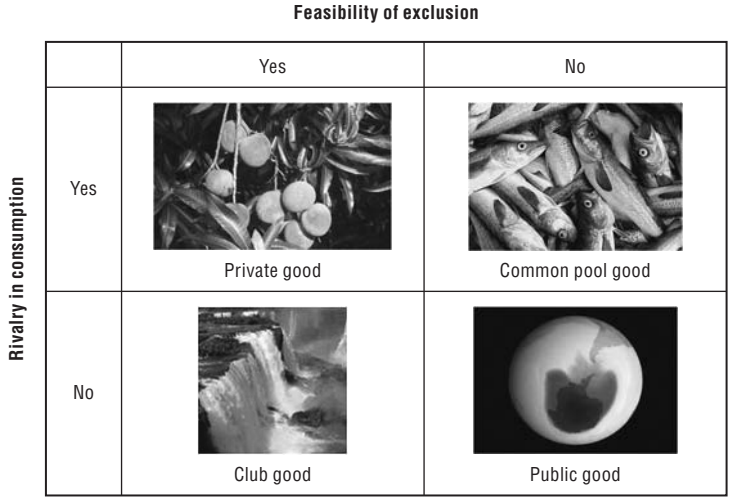
4.1.1. *Some key characteristics of natural resources and implications for governance*

The following two features determine to which of the four classifications of goods outlined below a natural resource belongs (Figure 4.1).

- **Feasibility of exclusion:** Is it feasible to control access to the resource (and exclude some users)?
- **Rivalry in consumption:** Can an agent use the resource without reducing everyone's individual utility?

Private goods are resources for which exclusion is feasible and there is rivalry in consumption. Examples include private lands, forests or mines. Private goods need not be in private hands. Resources owned by the state (*e.g.* land, naturally grown trees or mineral deposits) would also fall into the category of private goods, provided the state actually enforces its right to exclude unauthorised users from access to the resources. Generally,

Figure 4.1. **Characteristics of natural resources**



Source: Ostrom (1990), modified.

the parties holding property rights to private goods resources have direct incentives to use them in a sustainable way and to invest in their maintenance. Unclear or non-enforced access rights restrictions can, however, directly undermine these incentives. In many countries, for example, natural forests owned formally by the state are often *de facto* "open access", a factor that can lead to poor management.

Common pool resources imply a rivalry in consumption, but it is not feasible or it is difficult to exclude users from accessing them. Non-excludability tends to be an incentive to overuse a resource to improve individual welfare without bearing the costs. Typical examples are irrigation systems, some fish stocks and pastures.

Club goods are resources to which it is possible to exclude access but which can be consumed jointly without reducing the benefit of each single user. Normally, users pay an "entrance fee" which gives them the right to use the resource. Examples include natural reserves or game reserves which can be accessed with a licence, for which payment is normally required. There will often be a limit to the non-rivalry in consumption, and a need to restrict the total number of access licences awarded or sold.

Public goods are goods or services for which exclusive access is not possible and for which there is no rivalry in consumption. The incentives to generate or protect these goods are very low and public provision is needed. Protection from ultra-violet radiations from the ozone layer or carbon sequestration may be considered public goods. These services are not traded through market mechanisms and so do not appear in the conventional GDP measures. Their contribution to economic production is undervalued and so investment in managing them will be sub-optimal.

Many natural resources provide the basis for a multiplicity of "private", "public" and "club" goods and services simultaneously. Natural forests, for example, provide marketable timber and non-timber products, and non-marketed watershed protection services, which are shared by all communities in a given watershed, as well as biodiversity conservation and carbon capture which are global public goods. The interdependences between these different goods and services have to be taken into account when elaborating governance

regimes aimed at ensuring the sustainability of resource use. In some cases, competition between alternative uses (*e.g.* pastures *versus* agriculture) creates difficult trade-offs.

In addition to these characteristics, other features of natural resources have important implications for their effective governance:

Location in remote places. Natural resources are often found in remote areas where the state's ability to monitor and control access and enforce applicable laws and regulations may be limited. This creates important potential for abuses, corruption and conflict between different groups relying on the resources. These include, in particular, conflicts between indigenous populations and external actors.

Location across national and/or administrative boundaries. Many natural resources are located across several jurisdictions or are managed by competing institutions. This makes it even more difficult to define and enforce access and use rights.

Sharp spatial and temporal variations in productivity. Some natural resources are characterised by significant unpredictable fluctuations and variations beyond the control of users or competent authorities. Examples include sharp variations in water flows in rivers and canals and fluctuations in fish stocks. This not only makes management more technically complex but also fuels conflicts between users in times of scarcity.

Time-lag between action and reaction. Usually, the impacts of activities (*e.g.* resource extraction) influencing an ecosystem will materialise and become visible only with a considerable time delay. Ecosystems do not work in a linear way and can suddenly collapse. Fish stocks provide a vivid example. This renders a sustainable approach to resource extraction politically more difficult since it requires thorough monitoring to make the case to users to contain harvesting rates to prudent levels, in the presence of many uncertainties.

These special characteristics of natural resources (whether they are managed by private entities or by state institutions) create a range of management and institutional challenges. The effective management of "private good" resources depends largely on how well market mechanisms and associated institutions (such as those ensuring, for example, that information about prices is publicly available or that property rights are enforceable) work in practice. The management of common pool resources, public goods resources and club goods resources, for which market mechanisms are highly imperfect or completely absent, depends crucially on the existence and effectiveness of the rules and institutions (whether formal or informal) to govern their use, *i.e.* on "governance". Tackling the governance challenges is fundamental to pro-poor natural resource management.

4.1.2. Actors in a political arena: Implications for natural resource governance

Another essential factor for pro-poor natural resource-based growth concerns the characteristics of actors in the political arena related to the management of a resource. Typically, such an arena consists of a variety of actors, notably people who have an immediate interest in using the good. Actors such as public authorities who do not use the good in a direct way, but are involved in their management processes, also form part of the arena.

An analysis of the actors' arena should include *i*) their interests; *ii*) the identification of winners and losers of current and alternative policies; *iii*) their endowment with different types of capital; and iv) the flows of goods and services between actors in the widest sense,

including financial flows. Based on such an analysis, policies have to be designed, implemented and enforced in an effective way.

The interests of actors can hardly be generalised but have to be analysed on a case-by-case basis. Even within a government, no common interests can be assumed across different ministries and agencies, and responsibilities are sometimes difficult to assign. This holds true particularly in the case of natural resources. Typically, different agencies have responsibility for a partial set of issues around a given natural resource. This makes co-ordination a key task for effective environmental management.

The challenge of co-ordination is further compounded by very different histories, traditions, fields of expertise and institutional approaches that different agencies have, *i.e.* their human and social capital. The establishment of many environment ministries was supported by donors over the last two decades and they are often endowed with less power and political standing than other ministries. Therefore, it is important to be familiar with the unique features of each agency in a given country to understand its approaches and the challenges it faces.

Many ministries and departments of agriculture, forest, water or fisheries also often have to pursue competing goals such as, on the one hand, production and exploitation of a resource and, on the other, its protection for long-term use. Furthermore, priorities have also been changing over time in line with changed circumstances. For example, agencies responsible for fisheries and forestry have had to shift from a situation of abundance, where maximum exploitation of existing stocks for economic gain was the priority, to situations of scarcity where the sustainable management of remaining resources becomes paramount.

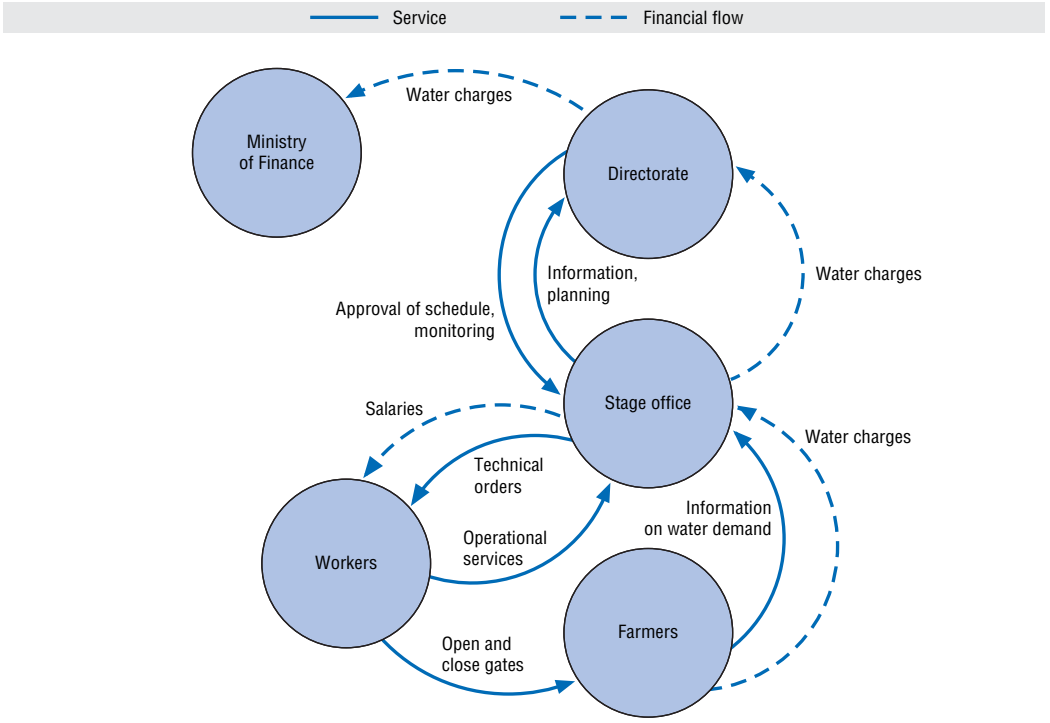
Nevertheless, the key political figures in any country, whether the president, prime minister or their cabinet colleagues, can play a vital role in driving change. In Indonesia, the committed minister for forests has sought to take on many of the vested interests in the forest sector. Kader Asmal, the South African Minister for Water and Forestry, was credited with helping to advance many reforms in the water sector. At the sub-national level, an active mayor can fulfil similar functions.

It is important also to include in the analysis actors who might not come to mind directly as relevant, as in the case of the judiciary. Although the judiciary is supposed to be "neutral" by definition, it might be one of the few actors that take concerns of natural resources and the poor into account, as demanded by law. In several countries, judicial activism has been a driving force in pro-poor environmental outcomes, *e.g.* in countries in South Asia and East Africa where the judiciary has traditionally played a strong role in public policy. Judicial activism has its weaknesses in that courts will often be ill-equipped to handle a major role in natural resource management.

An analysis of flows of goods and services between actors in the widest sense and the regulation of these flows can help shed light on additional incentive mechanisms that intentionally or unintentionally govern resource management. These will influence the effectiveness of related pro-poor policies. Such flows include, for example, the transfer of payments, information, labour and political support such as votes in a democratic election.

Figure 4.2 gives an example of a graphic illustration of such flows. In this case, an organisation (the stage office) is obliged to collect fees for water use, but has to deliver them to the directorate which transfers the charges to the ministry of finance, rather than

Figure 4.2. **Relationships between actors: A case study on irrigation**



Source: Fischer *et al.* (2007).

having rights on these fees. While these rules provide for direct revenues to the central budget, incentives are lacking to meticulously collect the charges.

Such open feedback loops occur where actors lack accountability towards their constituency or towards other actors affected by their use of the resource. Open feedback loops tend to be incentives that stimulate rent-seeking and opportunistic behaviour. For example, a forest administration may award licences from state forests to commercial timber companies without being accountable to the local population. This stimulates overexploitation of forests that undermines local livelihoods, without a democratic option for the local population to intervene. As there is no direct link between the local population on the one side and the forest administration or the timber companies on the other, no incentive exists that stimulates co-operation of these actors with the local population, or respect for their claims. In contrast, incentives to gain personal rents from selling the licences and overexploitation of the forest are considerably stronger (GTZ, 2004).

Policies that promote pro-poor sustainable management of natural resources thus have to take into account the role of actors in the political arena:

- Identify actors whose interests match the requirements for pro-poor natural resource-based sustainable growth. Individual and institutional champions committed to the cause are decisive if progress is to be achieved.
- Different actors hold different types and amounts of capital. These capital endowments determine their options to make decisions, use resources, or seek alternatives and diversify. Policies should equip poor actors with the necessary social, human or man-made capital necessary to manage natural resources in a sustainable manner in a way that leads these actors out of poverty. Access to information, participation and justice

can be improved through a variety of means. This can be done, for example, by extending public participation procedures into the earliest phase of decision making or the establishment of best practices of information disclosure and accountability (WRI, 2002).

- As outlined above, actors are connected through flows of goods and services, rights and responsibilities that regulate their interactions. Open feedback loops constitute incentives for sub-optimal resource management. Policies should thus provide for accountability of decision makers and establish rights and responsibilities that ensure pro-poor management of resources. For example, the creation or strengthening of local elected bodies with a mandate to govern local management of natural resources could help to close feedback loops between actors. Equally, strengthening the capacities of local authorities to conduct public consultations on land use planning and, at the same time, educating citizens on their rights and responsibilities could improve feedback between local populations and government (WRI, 2002).

4.1.3. Institutional framing: Formal and informal rules and their implications for natural resource governance and pro-poor growth

A third important factor for the sustainable, growth-oriented pro-poor management of natural resources is the existence of formal and informal rules, *i.e.* the institutions related to the management of a resource.

It might not make a difference to people's actual behaviour if rules are formal, that is to say codified, issued by a legislative process or formal decree, or if they are non-formal, that is, unwritten and customary. However, in some cases codified and customary rules might exist on the same issue simultaneously, but are conflicting or contradictory (Box 4.1).

Some rules might be enforced while others are not, regardless of whether they are formal or informal. It is thus important to differentiate between working and non-working rules. The effectiveness of enforcement mechanisms, in turn, depends on the social capital of actors and groups.

A particularly important rule relates to property rights. Property rights are bundles of rights that include one or more of the following:

- the right to control the use of the resource;
- the right to any benefit flows from the resource;
- the right to transfer or sell the property;
- the right to exclude others from the property.

Property rights can be held by individuals, groups (collectives, corporate entities), or the public (an entire community or the state). Reliable enforcement of property rights provides clear incentives for sustainable use of the resource.

However, typically the richer households and firms control access to natural resources through land ownership or logging, fishing and mining concessions. Hence, the assignment and enforcement of property rights has specifically to target and foster the access of poorer actors to natural resources and provide a framework for a reliable property rights regime. Box 4.1 describes a case where the central government ignores the existence of working informal rules on land use. The implementation of formal rules that are not adapted to the local situation is highly unfavourable for the local population including the poor, as external actors reap benefits from their land.

Box 4.1. **Clash of formal and informal land use rules**

In the uplands of Cambodia, land has been under communal ownership for centuries, quite possibly ever since these upland areas were first settled. Elaborate traditional rules exist for its management and use, accompanied by highly effective enforcement mechanisms, firmly rooted in the strong social capital of these communities. However, the rules are informal and unwritten.

They are thus not recognised by central governments, which often attempt to replace them with formal rules, such as land legislation. These formal rules are typically designed to manage lowland resources, which are traditionally under individual private ownership. Thus, they are not appropriate for the management of upland resources, and ignore or contradict the established systems of informal rules. Numerous conflicts over land resources result.

Among them are *a)* land appropriation by external actors who purchase land for nominal fees and have it formally registered, *b)* conflicts over the use of resources with concessionaires who have been granted exploitation rights by government, and *c)* even expulsion and resettlement of indigenous communities whose claims to ownership of their traditionally inhabited areas are not recognised.

Source: Fischer *et al.* (2007).

Box 4.2 provides an example of where the use of a common pool resource is subject to decision-making rules that neglect the different capital endowment of actors, in this case the financial capital of the bidders. Actors have thus unequal chances to obtain rights to use the resource, something that could potentially have been avoided if the poorer actors had had more influence when the decision-making rules were established.

Box 4.2. **Fisheries livelihoods dominated by the elite in Bangladesh**

In Bangladesh, rights to use water bodies, which are the property of the government, are often leased out for one to three years through an auctioning system that generates considerable income for the government. However, ordinary fishermen can rarely afford to bid, and so the license is purchased by rich investors, known as water-lords, who are often past or present members of the local institutions of the state. They hire fishermen as day labourers, while the sales revenue accrues to the leaseholder. These kinds of fisheries regimes have led to the institutionalised exploitation of fishermen through a small group of rural elite.

Source: Bene (2003).

Policies to promote pro-poor sustainable management of natural resources should thus take into account:

- the degree to which the rules favour richer or poorer parts of the population, for example where decision making and constitutional rules intentionally or unintentionally exclude poorer actors;
- the degree to which rules are enforced and whether this enforcement discriminates between poorer and richer actors;

- the property rights assigned, and how these correspond with the characteristics of the resource (*i.e* whether it has public, common pool, club or private good character) and with the capital held by the actors and the relationships between them.

4.2. Policies and measures for pro-poor, sustainable resource governance

Pro-poor growth-oriented sustainable natural resource management requires addressing these governance challenges. Therefore policy choices are needed that are political in nature. This is of critical importance for many highly resource-dependent countries.

4.2.1. *Types of measures*

Four different categories of measures can be distinguished (OECD, 1999):

a) *market-based measures* that have an impact on people's activities on markets, normally via the price mechanism, including the creation of markets, improved access to markets, or performance bonds that require collaterals from concessionaires to ensure that concession contracts are well managed;

b) *regulation*, *i.e.* governmental interventions or command-and-control measures that define the legal framework;

c) *co-operation*, *i.e.* measures that motivate people to change their resource use patterns by giving them the opportunity to participate in decision-making and governance processes;

d) *information*, *i.e.* measures that help people understand the actual benefits and costs of particular management techniques.

The impact of market-oriented measures is mainly based on their influence on prices. Market-oriented measures often aim to reflect the "true" prices of goods and services on the market in order to address open access to previously non-marketed goods and services. "True" pricing means that all costs and benefits of resource use should be included in price calculations. It aims, for example, to stimulate investment in technology that uses goods and services related to natural resources in an efficient way. Furthermore, the introduction of management contracts or payment schemes can create incentives for the provision of currently non-marketed public goods.

Regulatory measures are a precondition for the existence of well-functioning markets. For example, legal regulations are often essential to carry out privatisation measures. However, these approaches can not only support market-oriented incentives, but also replace them, for example when conservation measures are publicly financed. Enforcement of regulation has to be monitored and should be linked to accountability mechanisms which ensure that citizens, including the poor, can hold private and public actors accountable for their actions.

Co-operation and information measures can help users to manage their private property in a more efficient and sustainable way. Such measures can also support the appropriate pricing of resources, for example through labelling of certified products. Furthermore, the active dissemination of environmentally friendly technology can support better management outcomes.

Among the wide range of measures, some are more suited for private goods, while others are more appropriate for public and common pool resources. Measures should be

chosen that match the incentive structure constituted according to the type of resource. For example, management of common pool resources requires clear and reliable rules for access and use that could be enforced through authorities (regulation) but also through strengthened communities (co-operation). Information measures, in contrast, are well suited to improving the efficient management of private goods in situations where property rights are secure.

All these measures should also aim to increase the resilience of individuals, groups and the entire population in the face of shocks, and mitigate risk and vulnerability to incidents such as sudden changes of market prices, droughts and flooding, or illness (USAID, 2006).

Each measure, whether regulatory, market-based, information- or co-operation-related should be embedded in an appropriate institutional framework that allows the measure to be effective. Institutional modifications should always refer to existing institutions and take them as a starting point. This holds true for both the creation of rules and the development of organisations. Small changes to existing institutions are often much easier to implement and tend to last longer than institutions which are established from scratch.

4.2.2. Distributional implications

The measures outlined in the above section have an impact on the patterns of exploitation of natural resources, with direct consequences for the distribution of benefits of this exploitation and the sustainability of the benefits. Policy choices must thus be aware of these implications.

In India, joint forest management (JFM) guidelines were issued by the ministry of the environment in 1990. These guidelines are based on the idea that forest-fringe communities would have an incentive in protecting forests if they received adequate tangible returns. However, the precise nature of economic gains arising out of such programmes to these communities and the distribution of these gains remains a major research issue (Box 4.3).

As shown in Chapter 3, natural resource management will have to find a balance between economic efficiency, distribution of benefits among the poor and environmental sustainability. Exploitation by large-scale operators – whether foreign or domestic – (what may be termed a "top-down" approach) may focus on maximum economic efficiency, financial returns and export revenues. On the other hand, small or medium-scale operators (termed a "bottom-up" approach) may generate more employment opportunities and more equitable distribution of benefits for the poor. This will, however, depend on circumstances.

In the case of fisheries, for example, large-scale export-oriented operators will use different technologies and equipment, will concentrate on a limited number of target species, and are not very intensive users of labour as compared with their small-scale counterparts. In the case of forestry, large-scale operators, who are often linked to processing facilities such as sawmills, will concentrate on a limited number of timber species and make use of heavy equipment. Small-scale operators, by contrast, will extract a range of timber and non-timber products with little or no machinery.

Top-down exploitation by large-scale operators, such as large-scale mineral or timber extraction, often generates negative side effects in terms of, for example, pollution of waterways or loss of habitats for wildlife. The burden of these impacts does not fall upon

Box 4.3. **Participatory forest management in Himachal Pradesh, India: Benefit flows and distribution**

Himachal Pradesh is one of the most forested states in India with forest cover of 26% and is located in the northern part of the country in the Himalayas. It has a large rural population (90%) and a high degree of forest dependence. An assessment of benefit flows in selected forest villages shows that benefits from major forest products in terms of imputed forest income for villages which practice participatory forest management (PFM) exceed the benefits of non-PFM villages with similar socio-economic characteristics. The gains, however, are inequitably distributed across socio-economic groups with the better-off cornering most of the benefits.

The effectiveness of a PFM programme hinges crucially on the short-run benefits to forest-fringe communities. Project findings have shown that benefits do start accruing in the short-run where forest dependence is high. While the income enhancement objective of PFM is not in question, its distributive impacts are uncertain. The need therefore is to target interventions more directly at poorer economic groups, and to combine forest-based livelihood options, such as processing non-timber forest products, with non forest interventions such as agriculture development and the creation of social infrastructure.

Source: TERI: Economics of Forest Livelihoods.

the operators themselves but on people living in the vicinity of the operation. Unless these impacts can be minimised or those affected compensated in some way, this can lead to conflicts. This has been a major issue in resource-rich regions such as South East Asia and West Africa. In many cases it has led to violent conflicts between aggrieved local residents and these concessionaires, for example in the Niger delta or at the Bougainville and Ok Tedi mines in Papua New Guinea (Box 4.4).

Box 4.4. **Mining**

In the rain forests of Western Papua New Guinea, the effluents from the Ok Tedi gold and copper mine have since the mid-1980s led to an ecological disaster with major impacts on the livelihoods of the local populations living downstream. As the indigenous communities living downstream of the mine were not considered to have property rights related to the mine, they had been excluded from the decision making on the approval of the mine in the early 1980s. While the mine's operations and its boost to the national economy are likely to end in 2010, the negative external effects of the mining activities will stay for much longer, with the mine's shareholders assuming responsibility for these impacts only to a very limited degree.

Source: WRI (2002).

The pro-poor benefits of top-down approaches will depend on the extent to which the revenues from the resource extraction can be captured through fiscal means and channelled towards pro-poor expenditures. The pro-poor benefits of bottom-up approaches are more direct. They depend on the poverty status of the populations who live in (or migrate to) the area of resource extraction and who derive the benefits. Choices between these two approaches result from political processes. To ensure pro-poor outcomes, meaningful participation of the poor in these processes is crucial, as they are

often under-represented in decision-making processes and economically powerful interests often prevail.

4.3. Managing the policy process: Political change in support of pro-poor natural resource management

This section draws from recent experience to identify key lessons learned and options to support the political and governance changes needed for pro-poor growth. One of the most important lessons learned is that political change cannot be designed and imposed from the outside. Rather, it is the outcome of continuing social and political discussion.

Political change can follow the stages of a typical policy cycle that include *i)* problem definition; *ii)* agenda setting; *iii)* policy formulation; *iv)* decision making; *v)* policy implementation; and *vi)* policy evaluation. However, usually this is not a sequence of steps that is systematically followed. Problems have often been well known for some time but low on the agenda, before (sudden) events press for political action. Increased public awareness of the damage from poor resource management and waste can help drive change. For example, deforestation is often thought to be linked to flooding and drought and other negative impacts. Severe floods in the Philippines which affected society as a whole seem to have galvanized public attention to unsustainable logging practices and encouraged the government to crack down on well connected logging concerns.

To better understand the dynamics of political change it is useful to differentiate between the levels on which this change can take place. Three levels can be distinguished (Rohe, 1977 and GTZ, 2001):

i) the *operational* (policy) level, for example, changing the operational content of rules;

ii) the *process* (politics) level, changing the way decisions are made and institutions are implemented;

iii) the *organisational* (polity) level, changing political structures, for example restructuring the executive of a country's government.

The measures outlined in Section 4.2, namely market-based, regulatory, information and co-operation measures, can often be facilitated and implemented on more than one of these levels. For example, while donors can provide direct advice to a community on best practices of resource use, they can also enable the local authorities to initiate a process of knowledge sharing through participatory user group meetings and facilitate capacity building of local actors and staff. On the organisational level, donors can try to instigate changes in the way a regional ministry works, for example to combat corruption. However, they can also give advice on the process level to the government to help establish anti-corruptions strategies.

Knowledge about the level at which political change is required and takes place and the stage in the policy cycle helps to identify windows of opportunity for changes that promote pro-poor, sustainable resource use. Pro-poor improvements of resource management can be significantly facilitated by more general pro-poor political change. Many positive examples of pro-poor natural resource management have arisen after a regime change.

For example, in South Africa the election of the ANC led to a massive expansion in access to water and sanitation, increasing not only health and welfare in general, but also creating a large number of temporary jobs (Box 4.5). The window of opportunity during

which the new political power was engaged in active agenda setting was used to implement changes not only at the operational level, but also at the organisational and the process level, in an attempt to embed changes in an appropriate institutional framework. In Latin America, the general return to democracy in the last two decades has facilitated growing control by indigenous groups in forested areas.

Box 4.5. **South Africa's water laws and their implementation**

South Africa has been a successful pioneer in a rights-based approach to natural resources. In the field of water governance, two new laws were passed. These addressed the lack of water access and inequities in water distribution. For example, in the Mhlatuze basin in KwaZulu-Natal, more than 97% of water resources are allocated to only about 10% of the population. The Water Services Act provides more equitable access to safe drinking water and sanitation with water access to within 200 metres of the household. Since 1994, the department for water affairs and forestry has been able to provide basic water supply to 9 million people. In 2002 alone, 1.2 million people were recipients of water supply infrastructure, while 50 000 were given access to household sanitation. In the process, 25 000 person-years of temporary employment were created. Over 57% of the population now has access to water. The National Water Act will establish catchment management agencies (CMA) in each of South Africa's 19 water management areas, and these will have functions devolved from the centre. Five CMAs have been announced in an official paper or will soon be.

Source: Schreiner and Van Koppen (2002).

The poor are not passive in the face of political pressure, although they often face major hurdles and opposition. Much can be learned from processes where they themselves have initiated political change to demand a share of benefits from natural resources. There are some striking examples of how poor groups, with strong leadership and sophisticated use of the media, have organised themselves to demand access to natural resources, especially land. This is widespread in Latin America, illustrated by the rise of extractivist reserves for rubber tappers in Brazil.[2] Other examples are that of the Chiquitanos Indians of Bolivia, who in 1992 formed an organisation to protect their land from timber companies (McDaniel, 2003).

One of the challenges of these pro-poor movements is to up-scale, move from the local to the national level, and to attain broader changes on the operational, organisational and process levels. A successful example of this is the rise of poor fishing groups in Kerala and their battle with trawlers to control resource access.

Experience also suggests that driving political change requires making innovative alliances with both national and international civil society organisations (including religious groups, professional groups and trade unions). NGOs, which are often perceived as independent lobby groups, may also have many strengths in lobbying governments and supporting poor groups. Some NGOs, however, may have relatively shallow roots in their own society, and do not necessarily represent the poor.

International organisations, by bringing pressure to bear on resistant governments, can also help legitimise the claims of the poor. Private sector enterprises in turn, both foreign and national, have a major role to play in natural resource use. Governments may

lack the negotiating skills to design effective natural resource contracts. However, international firms are often sensitive to pressure from their shareholders and consumers not to increase poverty through their activities.

Although the awareness that development co-operation necessarily has to address governance issues as much as technical problems has developed only recently, donors have always played a role as drivers of change. Donors can influence such change on all three levels. On the operational (policy) level, change can be supported, for example, through technical or financial assistance, or through technical advisory services to resource users and organisations and through international exchange. On the organisational level, donors can provide organisations with advisory services on regulatory policy or on management and organisational issues. They can also foster networking between actors and thus change structures. On the process (politics) level they can provide advisory services with regard to policy processes.

Several donor agencies have developed analytical approaches such as the one used in this chapter (FAO, 1997; GTZ, 2004) that support the creation of a sound knowledge basis as the starting point of poverty reduction, involving environmentally and economically sustainable governance change. The UK's Department for International Development (DFID) uses country governance analyses (DFID, 2007) that focus on a state's political and economic capability, a government's accountability and its responsiveness. DFID's "drivers of change" approach takes a more general approach and helps to analyse the role of actors (agents), institutions and structural features in political change (DFID, 2005).

These approaches can be used to identify effective ways to promote sustainable pro-poor growth. With regard to the dynamics of such political change outlined above, it is particularly important to take the following aspects into account:

- Changes that enhance pro-poor growth through the sustainable use of natural resources are facilitated during periods that offer "windows of opportunity", for example, taking advantage of phases of problem identification, agenda-setting or policy formulation.
- Measures should target the appropriate governance levels (operational, organisational or process) in order to become effective in the institutional framework. While measures are often easiest to implement on an operational level, these might be least effective, as their functionality is dependent on favourable conditions at the process and organisational levels, for example by supportive conditions in the ministries. Often these governance levels are complimentary and re-enforcing and targeting multiple levels simultaneously or in succession may be most effective in protecting natural resources and ensuring pro-poor growth.
- Actors may take different roles in driving the change. Consequently, the role of donors in these processes varies, depending on the nature of the window of opportunity. In situations where poor actors have taken the initiative to stimulate new processes of agenda-setting, donors can actively support these actors on the operational, process and organisational levels.

4.4. Conclusions

This chapter summarised essential elements of governance that shape the management of natural resources. To establish governance mechanisms that foster sustainable pro-poor growth, a profound understanding of existing mechanisms and of the measures that could change the prevailing governance is essential.

Such elements of governance include:

- The characteristics of natural resources: Do they have a public, private, club or common pool resource character? Are the rules for their use enforced, or does an open-access situation prevail?
- The capital endowments and the flows of goods and services between actors: Do existing governance mechanisms favour or disfavour poor people in the use of natural resources?
- The existing formal and informal rules: Do rules exist, are they enforced, and who benefits from them (*e.g.* who benefits from the prevailing property rights regimes or from rules on public decision making)? What has worked in the past that can be built upon?
- The market-based, regulatory, information and co-operation measures that could change the existing governance mechanisms: what are their effects on the distribution of benefits? Do they set the right incentives for a sustainable use of the resources?
- The processes of change: how can change be supported and embedded so that outcomes are sustainable? How can co-operation between stakeholders be encouraged and participation of the poor be facilitated? How can flexibility in the choice of policy instruments be ensured?

Notes

1. Nobel Lecture, Oslo, 10 December 2004.
2. There is still controversy as to how much this has benefited rubber tappers.

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PART I

Chapter 5

Conclusions and Recommendations for Policy Makers

This chapter advocates and elaborates the following three-fold approach that policy makers in OECD countries can take to support sustainable natural resource management for pro-poor growth:

i) *Provide development co-operation support for improved natural resource management.*

ii) *Enhance policy coherence for development.*

iii) *Negotiate pro-poor multilateral environmental agreements.*

5.1. Conclusions

While the relationship between natural resources and pro-poor growth is complex and dynamic, there are some basic facts which deserve attention from policy makers if growth in developing countries is to yield its full potential for lasting poverty reduction.

1. Poor countries are much more dependent on natural resources as economic assets than are rich countries. Natural resource sectors provide important contributions for growth, exports, employment and public revenues in many developing countries.
2. Natural resources are a major, and maybe *the* major, asset of the poor. They are critical for subsistence and a significant source of income for many households. They help the poor to fight poverty and protect the non-poor from falling into poverty.
3. The international context of natural resource management is changing. Many emerging economies are major importers of natural resources. This increased demand makes improved resource management even more urgent.

For all these reasons, pro-poor growth strategies will need to be linked to improving natural resource management while ensuring that the poor have access to these natural resources and the rights, knowledge, capacities and accountability mechanisms to use these resources sustainably. This will require recognising that natural resource management is political in character and must be based on an understanding of the respective interests of key stakeholders, their incentives to work for, or against, reform and the key political factors that can be harnessed to promote positive change.

Broad consultative processes on national development strategies which engage and give voice to poor women and men can strengthen public demand for reform. These processes will often open up dialogue and debate, where concerns about natural resources are likely to emerge as development priorities, and will result in awareness of the need to challenge vested interests. Enhanced accountability mechanisms for the use of development resources should also be harnessed to achieve tangible improvements. Donors should better support both areas, *i.e.* efforts to strengthen participatory approaches in decision making and accountability mechanisms. Both areas are important for ensuring poor people's access to, and appropriate use of, natural resources and for enhancing aid effectiveness as outlined in the Paris Declaration on Aid Effectiveness.

Pro-poor changes in natural resource management have often occurred in the context of wider pro-poor policy changes, *e.g.* after regime changes. To make use of these windows of opportunity, it is important to be prepared for them, for example by raising awareness among decision makers, public and private stakeholders and the broader public of the actual and potential benefits of natural resources for the economy and the poor.

*** **Climate change** *poses additional pressure on poverty reduction and growth. In particular, some natural resource sectors which often play a very important role in developing countries' economies, such as agriculture, fisheries and forests, are also highly sensitive to climate change. While climate change is not addressed specifically in this paper, the threats it poses to natural resource productivity are increasingly recognised and should be addressed in natural resource management.*

5.2. Recommendations

There is widespread evidence of the positive catalytic role development interventions can have in facilitating positive change. This section highlights the main recommendations for action to better harness the potential of natural resource management for pro-poor growth. It highlights some of the key issues from the previous chapters as well as additional recommendations that are particularly relevant for policy makers in OECD and partner countries, including for development co-operation agencies. It advocates a three-fold approach:

- *Providing development co-operation support for improved natural resource management*. This includes demonstrating the benefits of improved natural resource management, supporting pro-poor governance of natural resources and empowering the poor.
- *Enhancing policy coherence for development*. This implies making sure that the policies of industrialised countries in areas other than development co-operation support, or at least do not undermine, developing countries' efforts to attain internationally agreed development goals. Policies of emerging economies have to be aligned with these goals as well.
- *Negotiating pro-poor multilateral environmental agreements*. This means providing political support for improved and secured access of the poor to natural resources in the context of negotiations of multilateral environmental agreements.

5.2.1. *Providing development co-operation support for improved natural resource management*

Demonstrating the benefits of improved natural resource management

Demonstrating the economic and social benefits of sound natural resource management is a precondition for the mobilisation of public resources for that management and the development of better policies. It is crucial to influence strategic planning exercises where various policies and interests compete for attention, as in poverty reduction strategies, national development plans and sector reforms.

Approaches which can be used to demonstrate and quantify the socio-economic importance of natural resource management include analyses of the contribution of natural resources to poor people's incomes and livelihoods, for example through participatory rural appraisals, Strategic Environmental Assessments and Poverty and Social Impact Assessments, "cost of inaction" analysis, green accounting and others. Active involvement of key stakeholders such as the ministries of planning and finance can improve the outcome of such processes.

But quantification of the value of natural resources is often hampered by lack of data and the poor quality of such data that there is. Basic information on stocks of natural

resources, their flows and the interventions affecting them often cannot be generated sufficiently, limiting evidence-based resource management. Donors can provide support for strengthening data and observational documentation and statistical capacities, *e.g.* by providing support for domestic strategies for the development of statistics and funding projects to build capacity related to tools, methods and data, as well as observations related to natural resources.

Supporting pro-poor governance of natural resources

While demonstrating the actual and potential socio-economic benefits of improved natural resource management is a precondition for attracting the attention of policy makers, natural resource management regimes must be based on sound institutions and governance regimes. Donors can provide support in a number of areas which can enhance the pro-poor governance of natural resources.

- *Support for design and implementation of market-based instruments for natural resource management.* Environmental fiscal reform (EFR) can be a particularly promising approach. Natural resource pricing measures, such as taxes for forest and fisheries exploitation and payment for environmental services, can protect natural resources from degradation that would impact on the poor, while generating fiscal revenues from natural resource use that can be spent on pro-poor investments.[1] Forests have a significant potential to generate public revenues, and some countries, such as Cameroon, now manage to generate 25% of their public revenues through timber taxes and other fiscal instruments.
- *Support the development of sound regulation and effective institutions that ensure poor people land rights and/or user rights to natural resources.* For example, rights-based approaches can contribute to an effective institutional framework for regulating natural resources such as soil and fisheries. If farmers and herders do not have the right to the long-term tenure of the land they use, the incentive to preserve the productivity of the land is lost. Furthermore, customary tenure rights should be considered. Successful fisheries often involve some form of rights allocation, *e.g.* secured and transferable long-term access rights for fishing. In Namibia rights-based fisheries management has clearly demonstrated economic and environmental success. The country has developed a competitive, nationally owned fishing industry that generated profits of over USD 350 million in 2001.
- *Support co-operation among natural resource users, i.e.,* measures that motivate people to change their resource use patterns by giving them the opportunity to participate in the decision-making and governance processes. For example, community-based natural resource management yields a measurable improvement in household welfare, stemming from increased economic activity, investment in community infrastructure and improved management of resources.

Promoting the use of Strategic Environmental Assessments

Natural resources are often indirectly impacted by policies outside the natural resources sectors, such as trade, infrastructure and private sector development. Thus it is of great importance that such policies also consider impacts on natural resources. Strategic environmental assessments (SEAs) are a particularly promising approach for doing so. SEAs are analytical and participatory approaches to strategic decision making that aim to integrate environmental considerations into policies, plans and programmes and evaluate

their linkages to economic and social considerations. A growing number of countries at all levels of development have legislation or regulations prescribing the application of SEAs and many more are introducing these as part of their suite of policy tools. The Paris Declaration on Aid Effectiveness, adopted in 2005, called upon donors and partner countries to "… develop and apply common approaches for strategic environmental assessment" and in 2006 the DAC guidance on *Applying Strategic Environmental Assessment* was endorsed.

To further SEA implementation, development co-operation agencies should be encouraged to use SEAs and support developing country partners with financial resources and knowledge to develop institutional capacities for applying SEA in their countries.

Empowering the poor

Empowering the poor, women and marginalised groups to take a more active role in formulating and implementing natural resource policies and programmes is of outstanding importance for pro-poor governance approaches. Institutions and governance have to ensure that the contributions of the poor to harnessing natural resources for pro-poor growth can be fully realised. That requires the removal of formal and informal institutional barriers preventing the poor from taking action to improve their wellbeing – individually or collectively – and limiting their choices, for example by increasing their access to land by land tenure reform and investing in institutions and infrastructure for responsible resource management. The measures necessary to achieve empowerment are closely linked to those to build better institutions and governance in general, but require a particular focus on the needs and capabilities of the poor. Some donors use country governance analyses that focus on a state's political and economic capability, a government's accountability and its responsiveness. The "drivers of change" approach is more general and helps to analyse the role of actors (agents), institutions and structural features in political change.

The following four elements of empowerment should be addressed simultaneously to strengthen natural resource management:

- *Increase access to information and transparency for the poor*. Information is power. Informed citizens are better equipped to take advantage of opportunity; access services; exercise their rights; and hold state and non-state actors accountable. Critical areas where information has to be disclosed and made accessible and understandable to the poor include state and private sector performance; allocations of, and payments for, concessions; financial services and markets; and rules and rights concerning natural resource management. Information and communication technologies targeting the poor should be used to complement efforts to broaden access to information more generally.
- *Strengthen accountability mechanisms*. Changes in rules and regulations have to be connected to efforts to strengthen the capacity of citizens, especially the poor, to monitor natural resource governance and hold state officials, public employees and private actors answerable for their policies, actions and use of funds. Government agencies, both administrative and political, and firms must enhance horizontal or internal accountability mechanisms, and should become more accountable to their citizens and clients for their performance.
- *Support local organisational capacity*. The ability of people to work together, organise themselves and mobilise resources to solve problems of common interest should be

enhanced. Coalitions of the poor and organised communities are more likely to have their voices heard and their demands met, as evidence suggests in the case of the successful mobilisation of marginal fishermen in Kerala, India.

- *Institutionalise participation*. Opportunities for poor people and other excluded groups to participate in decision making are critical to ensure that use of limited public resources builds on local knowledge and priorities, and brings about commitment to change. However, sustaining inclusion and informed participation usually requires changing the rules in order to create space for people to debate issues and participate in the setting of local and national priorities, budget formation and resource management control. Shifting substantial management control over natural resources to communities gives them a voice where often they had none. It often restores traditional rights that may have been lost as modern states centralised their authority, such as rights governing water use, forest collection or fishing.

While the benefits of empowerment of the poor for better natural resource management have often been significant, empowerment also exerts a substantial psychological effect on communities that may be even more important, particularly for the poor. This manifests itself as a new sense of pride and control over their lives, as well as greater confidence in dealing with others outside the community and with government authorities. This empowerment dividend is often augmented as local community members gradually develop the accounting, monitoring, planning and dispute-resolution skills that good resource management demands. The benefits of such new personal and group skills spill over into domains well beyond natural resource management.

5.2.2. Enhancing policy coherence for development

Natural resources in developing countries should become a key concern in shaping developed countries' policies. OECD countries should adopt a whole-of-government approach supporting the pro-poor use of natural resources in developing countries and the attainment of internationally agreed development goals such as the MDGs.

A variety of issues concerning policy coherence for development have to be addressed in important areas for the poor, such as agriculture and trade. For instance, in the fisheries sector key issues relate to the management of fisheries capacity, as well as marine resource management, investment rules for harvesting and processing fish catches, and the use of subsidies. Internationally, fisheries access agreements (FAAs), tariffs and tariff escalation, and preferential market access agreements raise specific coherence issues that may impact on developing countries' ability to develop their comparative advantage and economic potential in this sector. Greater transparency in FAAs is needed, as well as stronger monitoring and compliance capacity, aid for infrastructure, mechanisms to limit fishing, by-catch reduction, and improved research and statistics.[2]

Grants, subsidies and other support for developed countries' private sectors should not hinder poor countries' export opportunities. Tariffs in the fishery sector of some OECD countries have to be reviewed as they may harm the fishing sectors of poorer nations. For example, Fiji fishing communities are struggling due to unfair competition from foreign fishing boats that receive generous fuel subsidies, as well as subsidies for capital costs of ships and equipment. Fishery subsidies absorb USD 14 billion to USD 20 billion a year in OECD countries, benefit large companies more than poor fishing communities and deplete fishing populations on which poor countries' coastal fisheries depend.[2]

Corruption and lack of transparency surrounding public revenues from natural resources are other key issues that OECD countries should address more actively, as suggested in the OECD Anti-Bribery Convention and the Extractive Industries Transparency Initiative (EITI). The OECD convention is an important instrument for combating bribery of foreign public officials in international business transactions.[3] The EITI supports improved governance in resource-rich countries through the verification and full publication of company payments and government revenues from oil, gas and mining.[4] Further action is needed to develop initiatives that target other natural resource sectors, as oil, gas and mining are not the only areas where money is lost due to poor management and corruption.

These efforts should be complemented by efforts to foster demand for resources derived from sustainable harvest and production processes. An important approach is to promote internationally agreed corporate social responsibility standards such as the OECD Guidelines for Multinational Enterprises. These guidelines provide voluntary principles and standards for responsible business conduct in a variety of areas, including the environment. Private corporations and business organisations should be urged to adhere to the principles in the guidelines. Some donors are also supporting NGOs that act as watch-dogs of the overseas operations of multinational corporations.

Western consumers' interest in high environmental, social and economic standards of imports from developing countries should be harnessed for development, *e.g.* by supporting trade of certified products which meet high standards. Certification of natural resource supplies has huge potential for extension, especially for tropical forests. Currently, about 140 million hectares of forests are covered by various types of certification schemes. Conversely, the proliferation of standards can lead to market barriers against developing countries' products and should be resisted.

Furthermore, strong alignment of public procurement policies with certified resource supplies is a key step towards sustainable resource use. It is already practiced for legally sourced timber in countries such as the United Kingdom, Denmark and Japan.

There is also a need to fill a wide gap by ensuring that independent performance evaluation systems that reach beyond aid and to examine the footprint of all relevant OECD policies on the natural resource prospects of poor countries, as well as the natural resources governance record of developing countries themselves.

Finally, the key role of rapidly growing emerging economies in stimulating demand for natural resources must also be recognised, requiring the urgent extension of recommendations on policy coherence for development to key emerging economies. Many emerging economies must forge new partnerships with developing countries to secure continued access to commodities. For example, China is rapidly becoming a major player in natural resource markets, particularly in Africa, providing new incentives for rapid resource exploitation. Therefore emerging economies have to be included in international dialogue and co-operation on natural resource extraction, processing and use. Established forums for dialogue and co-operation, such as the OECD, have to reach out to emerging economies and include them in their activities. Joint activities should aim to ensure that all interventions by emerging economies on natural resources in developing countries, including both aid and other external policy measures that affect natural resources, can be shaped to support domestic efforts for the pro-poor management of natural resources.

5.2.3. Negotiating pro-poor multilateral environmental agreements (MEAs)

The conservation of the globe's natural resources can only be assured if the poor people who depend most on them benefit from their sustainable use and if those people have the power to govern the use of the resources and/or the ecosystems. In international negotiations to further develop and implement MEAs (such as the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the Convention to Combat Desertification) there is a need for increased awareness and knowledge of the links between conservation and sustainable use on the one hand, and access and revenue generation for the poor on the other.

Related approaches are emerging. For example, the Convention on Biological Diversity is developing an international regime for access and benefit sharing which can support the interests of the poor and of the global environment. As national implementation strategies get funds directly from the international community, ownership and incentives for effective national implementation of MEAs are weak. It is therefore crucial to improve ownership of national implementation strategies of MEAs in developing countries. Furthermore, key partner country strategies such as poverty reduction strategies, sector strategies and others should be informed by, and be coherent with, the national implementation strategies of MEAs. Finally, alert and permanent monitoring of the implementation of the MEAs, with particular attention to links between poverty and the environment, needs to be formalised in the reporting procedures.

Notes

1. OECD (2005), *Environmental Fiscal Reform for Poverty Reduction*, DAC Guidelines and Reference Series, OECD, Paris.
2. Recent work undertaken by the OECD on policy coherence for development outlines key findings and recommendations *inter alia* on fisheries and development policies: OECD (2007), *Progress Report on Policy Coherence for Development and a Coherent Framework for the OECD's Work on Development*, internal document.
3. *www.oecd.org/department/0,3355,en_2649_34859_1_1_1_1_1,00.html*.
4. *www.eitransparency.org*.

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Checklist for Practitioners

This checklist aims to help to translate the messages highlighted in this publication into concrete action. It contains a loose set of questions on natural resources and pro-poor growth linkages. These questions can be considered and addressed by practitioners of natural resource management in development agencies and their partners in developing countries to improve natural resource management.

Socio-economic aspects of natural resource management

- Is it known how important natural resources and ecosystem services are for the economy and the poor of the country, and is the knowledge considered in key development policies and programmes? What is the importance of natural resources and ecosystem services and what are the trends in terms of:
  - share of GDP;
  - share of exports;
  - share of employment for: agriculture, forestry, mining, fisheries, wildlife and other similar sectors;
  - comprehensive measurement of capital stocks, *e.g.* genuine net savings, green accounting;
  - income, employment, livelihood support and safety net functions for the poor?
- How can sustainable management of natural resources be proactively built into proposed programmes in different sectors (*e.g.* health, education, rural development, energy)? Are sectors asked to contribute to an assessment of how environmental and natural resources are affected by the proposed plans? Are plans modified with respect to the outcome of the assessment?
- To what extent are natural resources taxed? What is the share of tax in the state budget? To what extent are resources form taxation redistributed to the poor?
- Are there any subsidies pertaining to natural resource use? How are tariffs, for example on water and energy, set and collected (for domestic and industrial use)? Are there hidden subsidies *e.g.* trade restrictions and publicly funded infrastructure?
- Are there small and medium-scale enterprises which are natural resource-dependent (*e.g.* fisheries, forestry, mining, tourism)? What is their scale in terms of economic share of GDP and what are the trends over time?

- What are the natural assets upon which the poor depend in terms of income and wealth? How much employment or income-earning opportunities do natural resources provide, particularly to the poorest?
- What policies exist in respect of access to, and ownership of, natural resources by local communities?

Capacity and governance for natural resource management

- Is there sufficient capacity within institutions and agencies, at national and sub-national levels, to implement, manage, regulate and be accountable for use of natural resources? How can these institutions be strengthened?
- The characteristics of natural resources: do they have a public, private, club or common pool resource character? Are the rules for their use enforced, or does an open-access situation prevail?
- The capital endowments and the flows of goods and services between actors: do existing governance mechanisms favour or disfavour poor people in the use of natural resources?
- The existing formal and informal rules: do rules exist, are they enforced, and who benefits from them (*e.g.* who benefits from the prevailing property rights regimes or from rules on public decision making)?
- The market-based, regulatory, information and co-operation measures that could change the existing governance mechanisms: what are their effects on the distribution of benefits? Do they set the right incentives for a sustainable use of the resources?
- The processes of change: how can change be supported and embedded so that outcomes are sustainable?
- Are there any active ongoing debates about natural resource use? Can these debates be influenced by further analytical work, or by facilitating the engagement of other stakeholders?
- How are natural resources and growth concerns addressed in key partner country strategies? These can be integrated through instruments such as political manifestos, statements by key politicians, the country's poverty reduction strategy (PRS), and sector and trade strategies. How are these reflected in the national budget?
- Are key partner strategies informed by, and coherent with, national implementation strategies of multilateral environmental agreements, such as the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), and the Convention to Combat Desertification (CCD)?
- What are the priority needs and requirements for investment and institutional change for enhanced natural resources management? What would be the net benefits and to whom would they accrue? What is the rate of return, including non-market benefits?
- What are the primary challenges and opportunities for social movements, civil society organisations and large and small private sector stakeholders in relation to natural resource management?

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PART II

Chapter 6

Fisheries for Pro-Poor Growth

Fisheries are an important source of wealth for many developing countries. However, in many coastal areas fish stocks are severely threatened by overfishing. Institutional weaknesses, lack of capacity for effective policy implementation as well as the migratory and open access character of fish resources all pave the way for overexploitation. This chapter provides an overview of the institutional and political dimensions of sustaining fisheries for pro-poor growth.

6.1. Overview

Fisheries are an important source of wealth for many coastal and island developing countries. About 95% of the world's 50 million fishermen live in developing countries (FAO, 2007; OECD, 2008), and fisheries provide a critical source of food for millions. Internationally traded values in fish products from developing countries far exceed all other export commodities, and some countries generate up to 30% of their fiscal revenues through fisheries (OECD, 2005).

But fish stocks in many coastal areas of the developing world are severely threatened by overfishing. Institutional weaknesses, lack of capacity for effective policy implementation, as well as the migratory and open access character of fish resources underlie overexploitation.

To reconcile the joint objectives of growth, poverty reduction and the safeguarding of fishery resources, effective resource management is needed. Several political and management challenges in the fisheries industry, including illegal and unreported fishing, have to be addressed. Additionally, difficult choices regarding potential trade-offs between large-scale industrial fishing and local small-scale fishermen have to be made, and more public revenues from fisheries have to be generated. Notwithstanding these challenges, with improved management, fisheries can contribute increasingly to pro-poor growth, as several countries have shown.

6.2. The contribution of fisheries towards growth and the economy

6.2.1. Fisheries and GDP

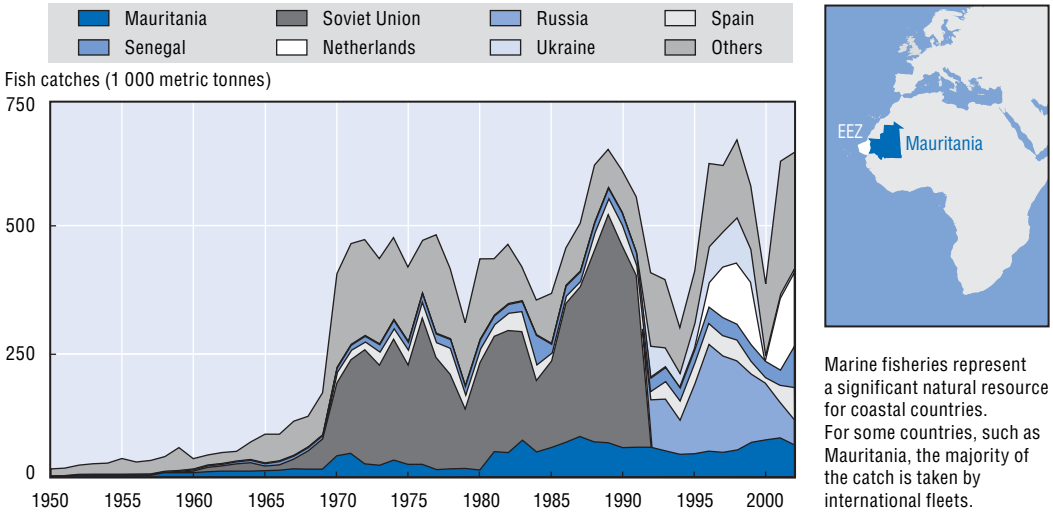
Fisheries contribute significantly to GDP in a range of low-income countries. The sector contributes more than 10% to GDP in some Asian countries, *e.g.* Cambodia, the Maldives and Kiribati, and more than 5% in African countries such as Gambia, Mauritania and Sao Tomé. In many Asian and West African countries, fisheries contribute between 2% and 5% to GDP (Sugiyama, Staples and Funge-Smith, 2004; Tallec and Kébé, 2006).

The fisheries sector has experienced a long period of expansion, but is now in crisis. Global marine production has increased six-fold over the last 50 years. Marine catches peaked in the late 1980s, and are now falling, despite increasing efforts (FAO, 2007b). In 2002, 72% of the world's marine fish stocks were being harvested faster than they could reproduce (UNEP, 2004). Higher value species are declining because of overfishing, and the production of low value fish for fishmeal[1] and oil accounts for 25% of the marine harvest (FAO, 2007b).

6.2.2. Fisheries and employment

Employment in fisheries and aquaculture is significant in developing countries, and has been growing steadily in most low- and middle-income countries. Fisheries provide employment for approximately 47 million fishermen in developing countries, mainly in Asia (84%). Most are involved in small-scale fisheries. In Indonesia alone, the sector employs more than 6 million people. Fishery also provides significant employment in

Figure 6.1. **Catches in the Mauritania exclusive economic zone (EEZ), 1950-2002**



Marine fisheries represent a significant natural resource for coastal countries. For some countries, such as Mauritania, the majority of the catch is taken by international fleets.

Source: University of British Columbia (2006), Seas Around Us Project, *www.seaaroundus.org/TrophicLevel/EEZTaxon.aspx?eez=478&fao=34&country=Mauritania&Hasnote=1&typeOut=4&Tx=1*, accessed 10 January 2006.

Box 6.1. **Aquaculture has rapidly gained economic importance, but is not necessarily pro-poor**

Aquaculture is growing globally, and makes up 20% of the global fish harvest in what is called the "blue revolution", to draw a comparison with agriculture's "green revolution". Aquaculture continues to grow more rapidly than all other animal food-producing sectors. Production from aquaculture has greatly outpaced population growth, with per capita supply from aquaculture increasing from 0.7 kg in 1970 to 7.1 kg in 2004, representing an annual growth rate of 7.1% (FAO, 2007b).

But large-scale, commercial aquaculture often imposes major costs on small-scale fishermen and farmers who face environmental hazards, rising land prices and the resulting externalities caused by pollution and degradation of land and water bodies, allowing them little opportunity to join the industry. In many cases, large-scale, commercial aquaculture receives state support, leaving small-scale prawn farmers with limited access to credit and know-how. Again the drive for profits has led to a boom and bust cycle of intensive shrimp cultivation followed by collapse because of spread of disease, with the cycle repeating itself. This has happened in several Asian countries.

Source: Personal communication with Network of Aquaculture Centres in Asia-Pacific, *www.enaca.org*.

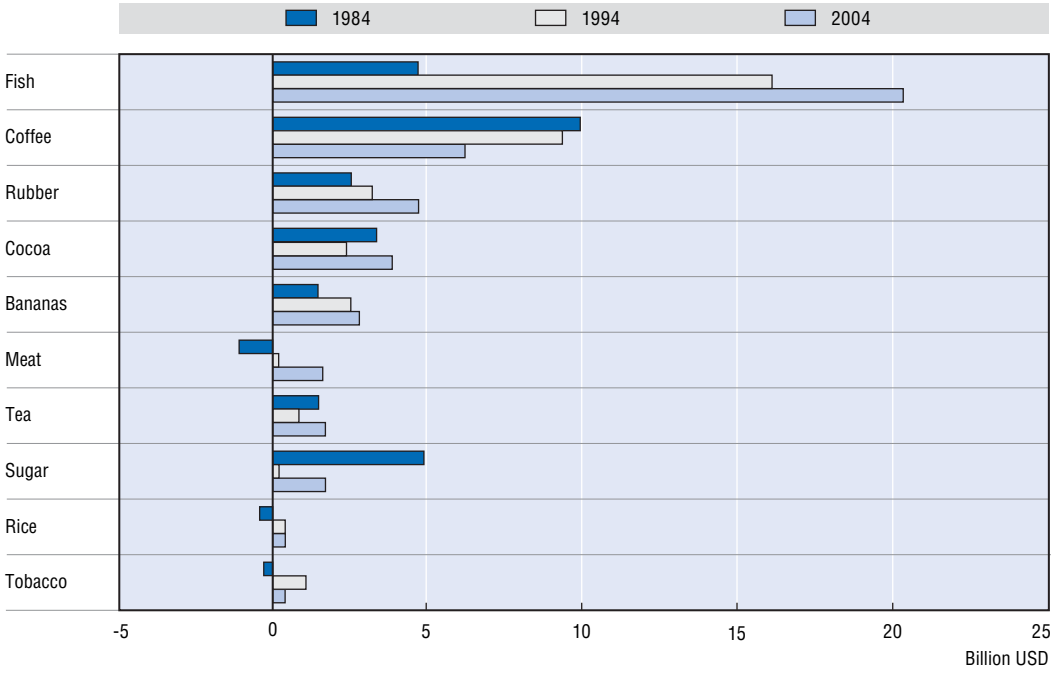
processing and marketing, which in many countries is primarily undertaken by women. Total employment including associated trades, input suppliers and fish processing probably exceeds 150 million (FAO, 2007b; MRAG, 2005a; MRAG, 2006b).

In several West African countries, 10% of the population or more earn their livelihood from fisheries, *e.g.* Benin (10%), Ghana (10%), Cape Verde Islands (14.6%), Gambia (15.4%). Inland and coastal fisheries and related fish processing and trading provide full or part-time employment to between 6 and 9 million people in sub-Saharan Africa (Tallec and Kébé, 2006; World Fish Center, n.d.).

6.2.3. Fishery exports

Fisheries can account for an important share of foreign exchange, and more than a third of the world's fish catch (by value) is traded internationally. Fish is the most valuable agricultural commodity that is traded internationally. Net export revenues from fish exports earned by developing countries reached USD 17.7 billion in 2001, more than coffee, cocoa, sugar and tea combined (OECD, 2006a; MRAG, 2005a; MRAG, 2006c). Seafood exports from Africa into the European Union were worth USD 1.75 billion and constituted the most important product among agricultural exports. For African least developed countries, the seafood trade was worth USD 570 million, and again this was the largest agricultural export product. There are at least 15 countries where fisheries provide over 5% of the exports. For some countries, particularly in West Africa and the Pacific, they provide 20-30% of total exports (FAO, 2007b).

Figure 6.2. **Net exports of selected agricultural commodities by developing countries**



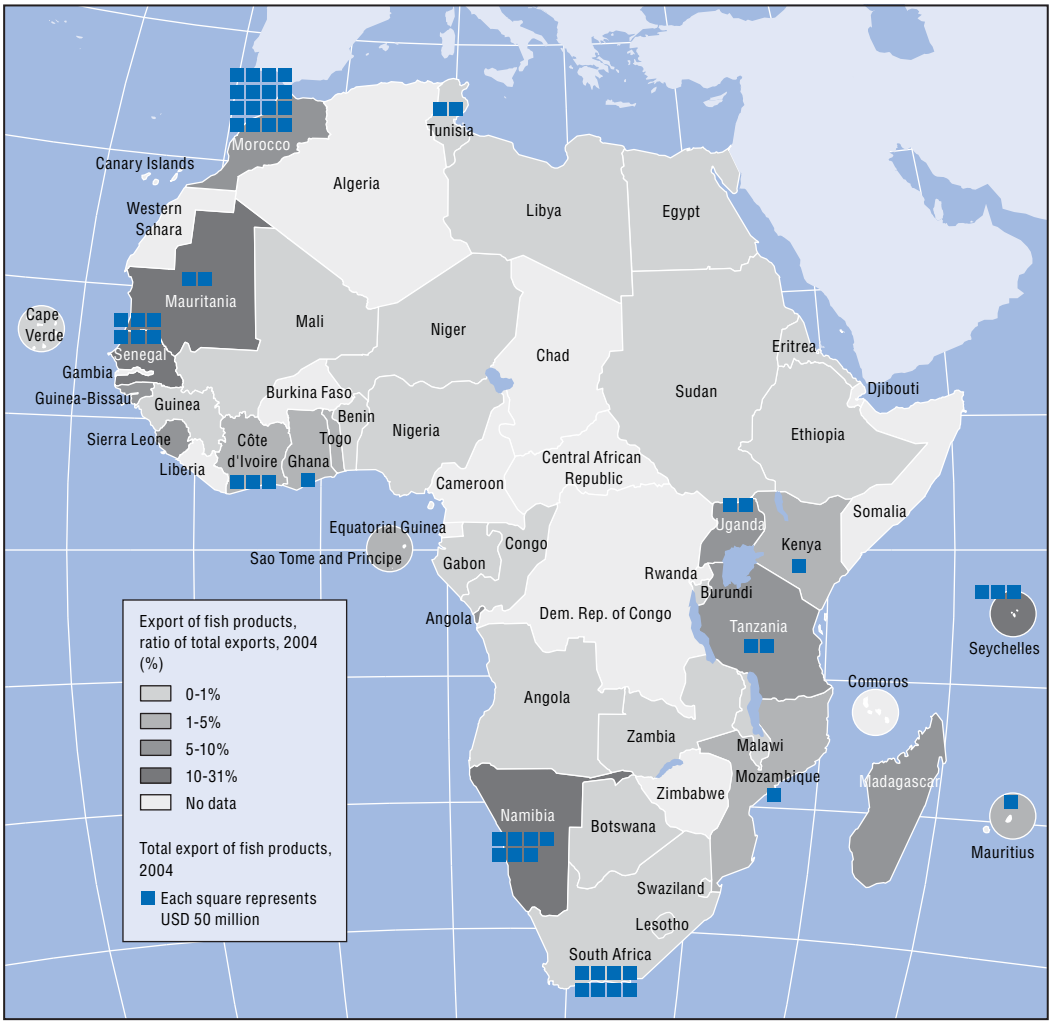
Source: FAO (2007b).

6.2.4. Public revenues from fisheries

Fisheries provide public revenues at the national level, particularly in fishery-rich countries. Many West African countries generate a large share of their public revenues through the sector. Between 1993 and 1999, fishery access agreements with foreign fleets provided 30% of the government revenue in Guinea Bissau, 15% in Mauritania and 13% in Sao Tome. At the local level, fishery taxes can provide a significant source of local revenues (OECD, 2005).

Mauritania had been looking for ways to increase the benefits from granting access to its fisheries resources to foreign fleets. The agreement signed with the European Union in 2001 provided for significant increases in financial compensation, greatly increasing the

Figure 6.3. **Export of fisheries products in Africa**



Note: For some African countries, particularly in West Africa and to a lesser extent also countries bordering the Indian Ocean, fisheries contribute significantly to exports. Real export figures may even be greater than official statistics suggest, given illegal trading. Furthermore, it is remarkable that the fish sector is important for a landlocked country like Uganda on the shores of Lake Victoria.

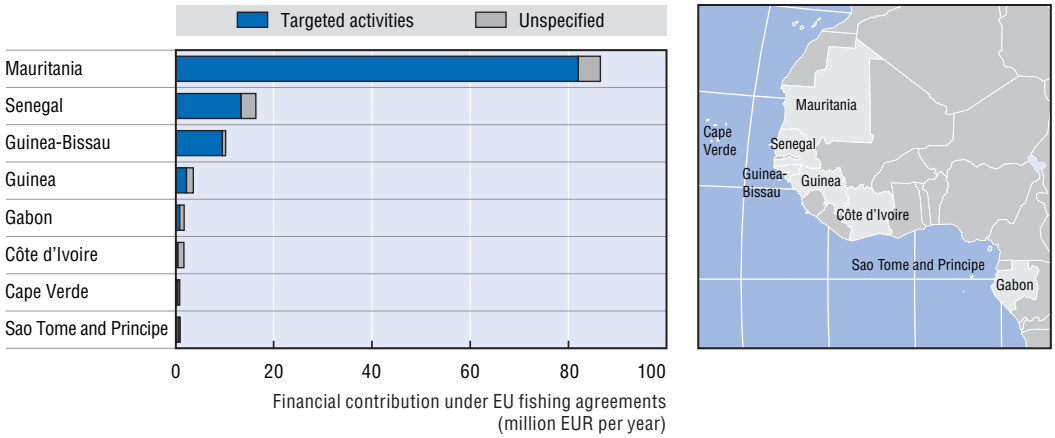
Source: FAO Fishery Information, Data and Statistics Unit (2006); FISHSTAT Plus – Fisheries commodities production and trade 1976-2004. *www.fao.org/fi/statist/FISOFT/FISHPLUS.asp, accessed 27 September 2006*. World Resources Institute (2006), *Earthtrends – Trade in Goods and Services: Exports of goods and services, http://earthtrends.wri.org/searchable_db/index.php?theme=5, accessed 27 September 2006*.

sector's contribution to the national budget. But it also included specific provisions for developing the local fisheries sector and improving the control and surveillance of fisheries activities, helping to conserve the resource. The latest agreement concluded with the European Union in 2006 includes annual financial contributions of EUR 86 million to the country, totalling EUR 516 million over the six-year period covered by the agreement (OECD, 2005; Agritrade, 2007).

6.2.5. Subsistence income from fisheries

The fisheries sector provides many poor communities with subsistence livelihoods. Some 50 million people dependent to some degree on fisheries are poor in absolute terms

Figure 6.4. **EU fishing agreements with West and Central African countries**



Notes: Financial contribution under EU fishing agreements (million EUR per year).
Fisheries activities by European Union countries in the seas of West Africa contribute EUR 120 million annually in government revenues. A part of the contribution is dedicated for the support of national fisheries policy to promote sustainable fishery resource management. For some of the poorest countries under these agreements, such as Guinea-Bissau, the EU payments represent a significant part of government revenues.

Source: FAO (2006), Contribution of fisheries to national economies in West and Central Africa – Policies to increase the wealth generated by small-scale fisheries, New Directions in Fisheries – A Series of Policy Briefs on Development Issues, No. 03. *www.sflp.org/briefs/eng/03.pdf* (accessed 4 October 2006).

Box 6.2. **Economic role of the fisheries sector in Bangladesh**

The fisheries sector is important for the Bangladesh economy. It accounts for some 4% of GDP and more than 11% of annual export earnings. The sector provides income to some 1.5 to 2 million full-time and around 12 million part-time fishermen. Furthermore, fish producers are among those people classified as extremely and moderately poor, male as well as female.

Within the sector, inland capture fisheries contribute 51%; aquaculture 21%; marine industrial fishery 1%; and marine artisanal fishery 27%, to total production. Government of Bangladesh statistics show sector annual growth rates of around 6.5%. Demand for fisheries products is strong and is expected to continue to grow.

Source: FAO Fishery and Aquaculture Country Profile Bangladesh (n.d.), *www.fao.org/fi/website/FIRetrieveAction.do?xml=FI-CP_BD.xml&dom=countrysector&xp_nav=1&xp_displayType=menu,* accessed 16 October 2007.

(OECD, 2006a). In Africa, some 150 million people (men, women and children) are primarily dependent on fisheries[2] for their livelihoods (World Fish Center, n.d.). For many poor families, fishing is a way of reducing their vulnerability to risks by supplementing and diversifying their incomes. It also provides a safety net for the poor when other economic opportunities are limited or other food sources such as agriculture are at seasonal lows. Small-scale fishermen provide half the world's fisheries production for direct consumption (MRAG, 2006c). Small fish are especially important for poor consumers, as they can be purchased in small quantities at low cost.

An estimated one billion people, mostly in low-income countries, depend on fish as their primary source of food (UNEP, 2004). Fish is also often one of the cheapest and most accessible sources of protein available to the poor. One billion people worldwide rely on fisheries as their main source of animal protein (MRAG, 2006c). In low-income food-

deficient countries (LIFDCs), fish makes up 22% of animal protein consumption overall (MRAG, 2006a). Additionally, fish is an important source of minerals and micronutrients to many low-income households.

6.3. What role can fisheries play in lifting people out of poverty?

The way that fisheries and aquaculture can contribute to pro-poor growth has been re-evaluated in the last two decades. Past approaches assumed that poor fishermen would benefit from increasing fisheries production and (often subsidised) technology. But this had disappointing results, with over-capitalised fishermen chasing fewer and fewer fish. There is now a greater focus on resource management and on improving governance processes to tackle the challenge of open access. Now the challenges are to *i*) increase growth, *ii*) ensure that the poor benefit from the resulting growth, and *iii*) sustain fisheries for pro-poor growth.

6.3.1. Increase growth through fisheries management

Reduce fishing effort in a pro-poor way. Sustainable harvesting of an overfished stock can be achieved by reducing fishing effort. This can be done by reducing fishing inputs, *e.g.* the type and amount of gear used, the number of fishing boats, or the capacity of each boat. Controlling fishing input can be done through various measures, including licensing (*e.g.* of vessels), allocation of rights (*e.g.* total allowable catch, individual quotas), and regulation (*e.g.* on gear types and sizes). The relative importance of various policy objectives determines the combination of measures that should be applied. If the objective is to maximise the generation of rents from, and economic value of, fisheries, that may entail restricting access to a small number of highly cost-efficient fishing boats, whose profit could be shared with the state through taxes, auctioning of access rights or other mechanisms. If, however, employment is the primary concern, a larger number of small vessels may be allowed access. Whatever the policy objectives, new styles of co-operation such as co-management structures in communities can be a way to address community-based fisheries management. Furthermore, the code of responsible fishing developed by the Food and Agriculture Organization (FAO) of the United Nations can guide fisheries management.

Raise productivity without creating overcapacity. It is important to invest in more productive fishing techniques and processing, but without creating overcapacity. This can be done by promoting competition, while subsidisation can encourage excessive capacity. For example, the Federated States of Micronesia spent USD 120 million to develop their own tuna-processing industry (as compared with a GDP of USD 194 million in 1993), but by 1995 all plants were operating at a loss (Schurman, 1998).

Combat illegal fishing. Illegal, unreported and unregulated (IUU) fishing[3] is a serious global problem, particularly in some of the poorest parts of the world. It represents a major loss of revenue, and can reduce food security.[4] In Guinea, up to 60% of vessels sighted during patrols in 2001 were fishing illegally. Under-reporting can be as high as 50% in Kenya and even 75% within the shrimp fisheries in Mozambique. The estimate for the total value of all IUU fishing across sub-Saharan Africa is about USD 900 million, or 16% of the total catch value for these countries. Many African countries could increase their GNP by up to 5% by eliminating IUU fishing and increase public revenues from fishery rents (MRAG, 2005b).

6.3.2. Ensure the poor benefit from growth through fisheries management

Ensure that industrial fisheries do not harm the poor. Subsistence fishermen are among "the poorest of the poor". In general, there is a direct link between the volumes caught offshore by commercial vessels and the possibilities for exploiting the same species in coastal zones. A major concern in such cases is competition between coastal self-employed and independent small-scale fishermen and domestic and foreign commercial fleets for the same fish stocks. Small-scale fishermen are politically marginalised, and typically have little influence on the negotiation of access agreements, so they get only limited benefits. Declining catches by self-employed fishermen caused by competition with industrial fishing vessels has been a major issue in West Africa and parts of Asia, such as Thailand, Indonesia and Cambodia.

Increase public revenues from fisheries. In the absence of taxation, the financial benefits from exploiting fisheries resources are fully captured by the private sector, without compensation to society at large. In addition, individual operators have no direct incentive to restrict their catch, since they do not, individually, derive any direct benefits from doing so. Imposition of levies on volume caught, in combination with proper management measures – which may include restricting access to fishing grounds – can generate revenues to compensate the owners of the resource, (*i.e.* the country whose fishing stocks are being exploited) and help reduce fishing efforts. Several African countries provide examples of how public revenues could be significantly increased (Box 6.3).

Box 6.3. **Hard bargaining for public revenues from foreign fishers: Successes in Africa**

Many developing coastal states are unable fully to harvest their fisheries resources. For them, fisheries agreements with foreign fleets are the main mechanism for generating public revenues from fishery resource extraction and regulating the catch. The agreements generally provide for financial compensation to be paid by the foreign country (or private operator) to the country in whose waters the fishing takes place.

Countries which have entered into access agreements include some of the poorest and least developed, such as Angola, Guinea Bissau, Mauritania, Mozambique, Sao Tome and Senegal. While these agreements represent significant financial resources, the potential for public revenue generation has not yet been fully realised. Until recently, access fees were equal to less than 1% of the total estimated value of the catch. Over the last six years, countries have stepped up their bargaining efforts, often supported by NGOs. Subsequently, Mauritania doubled its revenues to 30% of GDP, and Madagascar's shrimp fishery licence succeeded in capturing 8% of the fishery value by 2003.

Senegal signed a new agreement with the EU in 2002. It includes decreased fishing possibilities of sensitive stocks for EU vessels and provides for a two-month biological moratorium to give more protection to fish stocks and to minimise the risk of competition with the independent small-scale fleet. The financial compensation has also been increased from EUR 12 million to EUR 16 million a year.

Source: Rojat, Rojaosafara and Chaboud (2004); Europa: Gateway to the European Union Press Release 26/06/02: Commission welcomes renewal of EU/Senegal fisheries protocol, *http://europa.eu.int*.

Ensure that revenues raised are used for pro-poor expenditure. Typically fishery revenues enter the general treasury, so their pro-poor impact depends on the extent to which general government expenditure is pro-poor. However, there are cases where some of the

revenues are earmarked for improved fishery management, *e.g.* enhanced monitoring, control and surveillance.

Enhance opportunities for small-scale fishermen. Most fishery value-added production is capital-intensive, technology-intensive and skill-intensive. To benefit, fishery producers may need to form associations to negotiate better terms. Fisheries co-operatives, over the last two decades, have become discredited, as access to subsidised equipment and credit has led to elite capture and politicisation. However, there are several ways in which these groups can be supported to increase the value of the fishery assets of the poor, setting in place proper investments, policies and institutions. Investment can be made using the resources collected through devolved rent collection. One critical area is the provision for cold storage of the fish catch, both at landing sites and during transport. Since fish degrade quickly in tropical environments, up to half the landings may be lost before they reach the market. Other investments can include roads and electricity and the construction and management of landing sites. Furthermore, purchasing monopolies at the local level should be abolished.

6.3.3. Sustain fisheries for pro-poor growth

Fisheries tend to be an open access resource. It is widely recognised that free and open access often leads to overfishing. In Asia, the cumulative weight of fish living in coastal waters is estimated to be 8% to 12% of what it was 50 years ago. Even with more fishermen and more sophisticated equipment, the fish caught per unit of effort has been declining. In the Gulf of Thailand, the catch per hour by the same ship with the same equipment fell from 300 kg/hour in 1961, to 18 kg/hour in 1999. Collapsing fish stocks can have dire consequences for those who have come to depend on the resource (Bass and Steele, 2006).

Box 6.4. **Improved fishery management and increased rent capture in Namibia**

Before independence in 1990, access to Namibia's fisheries resources was largely uncontrolled and coastal waters were massively overfished, primarily by foreign fleets. The newly elected government instituted a new policy, a legal and management framework to manage effectively its fisheries and develop a domestic industry. Quota fees – based on total allowable catches for major species – and licence fees were introduced with fishing rights biased in favour of Namibian vessels. By-catch fees and a marine resources fund levy were imposed, based on tonnage of landed catch, to finance fisheries research and training. As a result, the sector contributed about USD 220 million to GDP in 2000 and was valued at USD 354 million in 2001. The indirect benefits have also been substantial: the fish-processing industry has grown rapidly. The number of whitefish-processing plants has grown from zero in 1991 to more than 20 in 2002, and employment in the sector has increased to about 14 000 people. The government also invested heavily in monitoring activities, with an integrated programme of inspection and patrols at sea (*i.e.* onboard observers), on land (monitoring of port landings) and in the air (via satellite). While expensive, this investment pays off. The ratio of monitoring costs to value of landed catch declined from an annual average of 6% over 1994-1997 to under 4% in 1999, reflecting an increasing value of landed catch. Namibia's rights-based fisheries management system incorporates an effective monitoring and compliance system at a cost that is commensurate with the socio-economic value of the sector. As a result, Namibia enjoys very high levels of compliance by its fishing industry, a situation very different from that in 1990. In its efforts to improve fisheries management, Namibia has benefited from assistance from several donors.

Source: Nichols (2003).

Shape rights-based institutions. A critical factor for sustaining pro-poor outcomes is the establishment of rights-based institutions in fisheries management. Most examples of successful fisheries involve some form of rights allocation, *e.g.* secured and transferable long-term access rights. Rights remove perverse incentives to race for fish and lead towards efficiency, rent optimisation and wealth accumulation. Furthermore, rights have clearly demonstrated economic and environmental success in countries such as New Zealand and Namibia. Namibia has developed a competitive, nationally owned fishing industry that generated profits of over USD 350 million in 2001 (Nichols, 2003) (Box 6.4).

6.4. The politics of sustaining pro-poor fisheries

Poverty in fisheries areas has major institutional and political dimensions. Fisheries may be capable, with appropriate management, of generating considerable wealth, which can then be reinvested in the economy and used as a basis for economic growth, poverty reduction and equitable distribution. However, the success of this process will depend on the institutional capacities of various types and the incentives required to make the right investment choices and to ensure effective implementation. To reconcile the joint objectives of growth, poverty reduction and the safeguarding of the fishery resource, there is a need for effective management. While state fishery departments have a vital role, they are often limited in capacity and prone to patronage. The high value of fisheries for the economies of many developing countries leads to high rents in the sector, which drive political incentives that are not necessarily pro-poor. However, there are examples where the government and the private sector have worked together to improve management, as was the case in Madagascar's shrimp industry (Box 6.5).

Box 6.5. **Promoting growth of the Madagascar shrimp industry**

Shrimp-fishing has been developed into a major industry in Madagascar. From the 1960s, it was managed through annual licences allowing access to either exclusive or common fishing zones. In the mid-1990s irregular and discretionary licensing exacerbated competition among fishing companies and a loss of confidence between the State and the private sector resulted in overfishing and serious threats to the future of the fishery. In 1994, on the joint initiative of the shrimp industry and government, a professional organisation was set up, designed to represent its members' interests and develop a fair policy dialogue. In 2000, a decree introduced new fishing rights, raised fees and made licences longer-lasting, transparent, competitive, transferable and dependent on annual economic performance reviews. Although some challenges remain, considerable progress has been made in building up working institutions, which show evidence of a successful co-management approach that is also paying off in economic terms. The shrimp industry is now providing USD 75 million in foreign exchange earnings, and licence fees have reached 8% of the catch value.

Source: Rojat, Rajaosafara and Chaboud (2004).

There is an urgent need to limit open access, but where many different fishermen use a single body of water, such as a coastal area, lagoon or lake, there remain limited incentives to work collectively over the short term. In most countries large-scale fishermen will have greater political access than smaller-scale self-employed fishermen. Often commercial fisheries will be given greater support by the state. Politicians also find it hard

to resist demand for subsidies for fishing gear, a factor that has contributed to overcapacity in the sector in many countries.

But access regulation provides advantages over the long term, *e.g.* preventing the degradation of the resource and subsequent increases in poverty. Comprehensive longer-term visions of resource management are needed, *e.g.* fleet size reduction combined with the development of economic opportunities beyond fishing, aiming at higher longer-term benefits.

There are also positive examples where the private sector has been forced to behave more responsibly. This can be facilitated both by government efforts and by the market through the development of fishery certification, which is now taking off through, for example, the Marine Stewardship Council. Most of the examples of certified catches are still from the industrialised world, but there are a few from the developing world. One is the South African Hake fishery (Box 6.6), and another is Vietnam's 2005 certification that was signed to promote sustainable fisheries throughout the country, starting with the catches of clam and anchovy.

Box 6.6. **Pro-poor growth in South Africa's hake fishery**

The lucrative fishing of hake took off in the 1950s to peak in the 1970s at more than 300 000 tonnes. Half of this was caught by foreign vessels. By the mid-1970s the fishery industry had collapsed from overfishing. The exclusion of foreign vessels and a conservative management strategy led to a gradual recovery. Since the late 1970s, the fisheries industry has been managed by company-allocated quotas and a Total Allowable Catch (TAC), limiting the numbers of vessels. The TAC had recovered to 164 000 tonnes in 2005 and accounted for half the value of South Africa's fisheries, and the industry has also been able to export to Europe and the US. Only domestic vessels are allowed to fish, of which 61 are deep sea and 29 are inshore boats. In 2004, the South African Deep Sea Trawling Industry Association decided to seek certification and in 2005, became the first hake fishery in the world to be certified as sustainable. Roy Gordon, managing director of I&J, one of the largest hake-processors said: "*This will help gain entry into new international markets which in turn would also mean the creation of additional jobs for South Africans and rich returns on the country's valuable hake resources.*"

Source: MSC (2005).

Pressure for pro-poor growth will require taking on the political forces that limit the voice of poor fishermen and a more pro-active private sector. Achieving this goal will require coalitions to drive reform from the poor themselves, supported by civil society and, where appropriate, external pressure. This is challenging, but there are some examples of limited success – for example in Kerala, India (Box 6.7).

Box 6.7. **Trawler bans in Kerala: Mobilisation of marginal fishermen to demand pro-poor growth**

"Our only hope lies in the sea, for we know that it belongs to the dead, the living, and those yet unborn."
Kerala fisherman

Until the 1960s, fishing in the southwest Indian state of Kerala was largely restricted to non-motorised craft dominated by certain caste groups. In 1961 there were an estimated 60 000 traditional fishing crafts. In the mid 1960s the government, with donor support, started to introduce small trawlers to take advantage of the rising demand for prawns. This led to declining real incomes for self-employed fishermen, from INR 850 a year in 1974 to INR 420 a year in 1982. There were also fewer fish available for poor consumers, for whom it was the main source of protein. In the 1970s, conflicts between trawlers and independent fishermen led to the formation of a trade union: the Kerala Independence Fishworkers' Federation. In 1981, this federation demanded a trawler ban when fish spawning takes place and a trawler-free coastal zone. Their tactics included fasts, road-blocks and protests at the government secretariat in the capital Trivandrum. Political parties created fishermen's organisations and joined in, to benefit from this mobilisation. Legislation was passed for zoning, and in 1989, after much agitation, the trawler ban was introduced. This ban was later dropped, but the self-employed fishermen have moved from being a marginal group to a key political force.

Source: Kurien (1992).

Notes

1. Fishmeal is used as feed for aquaculture and animal feed.
2. These are notional estimates. They do not account for millions of part-time, subsistence and seasonal fishers. According to ICLARM (2001), some 51 million people (95% of them in developing countries) rely directly on the sector for their livelihoods and another 10 million people are involved in aquaculture. If employment in related industries is taken into account, over 200 million people around the world heavily depend on fishing for their livelihoods.
3. IUU fishing within EEZ (Exclusive Economic Zones) encompasses poaching, under or non-reporting, or unauthorized fishing by area, season, gear, quota, or species. Outside EEZs, there may be non-compliance with an RFMO (Regional Fisheries Management Organisation), or there may be unregulated fishing outside the area of an RFMO.
4. IUU fishing also contributes to a loss of marine biodiversity and other negative environmental effects that are not in the focus of this report.

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PART II

Chapter 7

Forestry for Pro-Poor Growth

The forestry sector contributes substantially to GDP and employment in many developing countries. A high percentage of people living in extreme poverty depend on forests for some part of their livelihoods. This chapter highlights management improvements that can help ensure long-term sustainability of the forestry sector and maximize its contribution to pro-poor growth.

7.1. Overview

The forest industry is a major source of growth and employment. In many countries the sector contributes more than 10% to GDP and provides formal and informal employment in developing countries for an estimated 40 to 60 million people. Many developing countries also rely on timber for export earnings. Over 90% of people living in extreme poverty depend on forests for some part of their livelihoods (World Bank, 2004a). But global forest cover has been reduced by at least 20% since pre-agricultural times. While forest area has increased slightly since 1980 in industrial countries, it has declined by almost 10% in developing countries (WRI, 2000).

Natural forests, as distinct from tree plantations, are valuable resources which in most countries are under state ownership. But weak enforcement of forest management regulations and large-scale corruption limit the potential of the forest sector for poverty reduction in many countries. Better institutions are needed both for ensuring the long-term sustainability of the sector and for improving revenue capture by the state. There are positive experiences in South Asia, Latin America, and Africa from which lessons can be learned.

7.2. Contribution of forests towards growth and the economy

The forestry sector in Africa makes a valuable and significant contribution to national economies, especially in terms of income and exports. In addition, informal activities in the sector contribute to income and employment generation.

7.2.1. Forests and growth

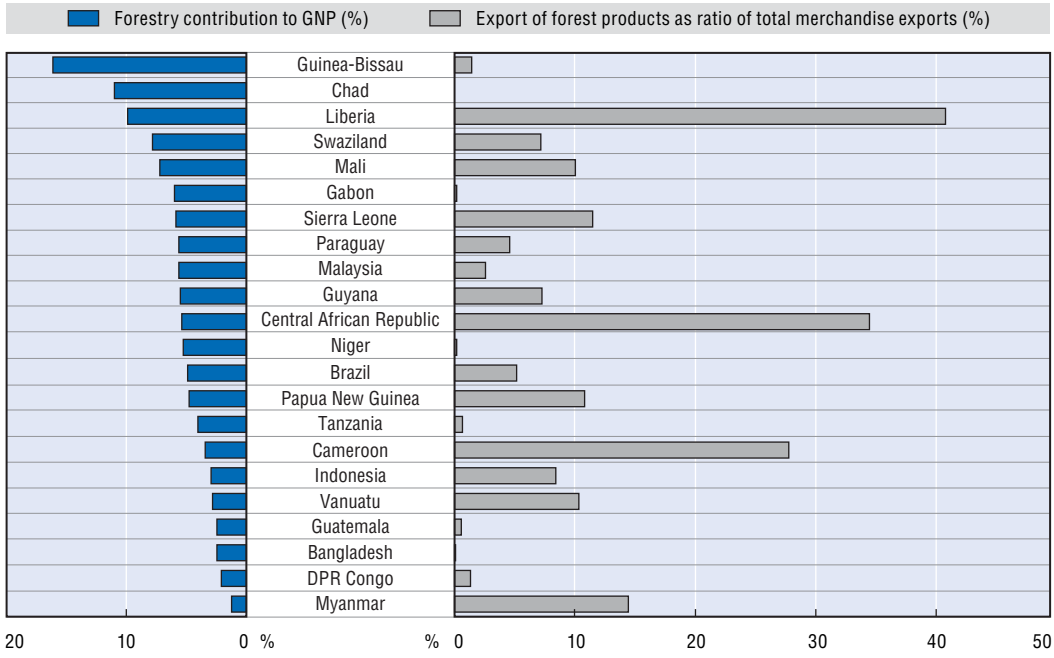
The formal forest sector provides significant contributions to growth in many developing countries. At various times throughout the past decade, forest-related activities have accounted for at least 10% of the GDP of 19 (forest-rich and forest-poor) African nations and more than 5% for many more countries around the world. In absolute values, the contribution of forests to growth in Africa stood at USD 8 billion in 2000 (World Bank, 2004a; Lebedys, 2004).

Forests are consistently and seriously under-evaluated in official statistics. For example, in Indonesia official data show that forests contribute 1% to 2% of GDP, whereas the World Bank estimates that the potential value of forests to that economy is closer to 15% to 20% of GDP. Forests provide important watershed, soil management, pollination and pest management functions that usually are not captured by markets. While extremely difficult to quantify, there is general agreement that the value of forest ecosystem services outside formal markets is significant (World Bank, 2004a).

7.2.2. Forests and exports

While production in most developing countries is consumed domestically, forests contribute significantly to exports in several states. There are about 10 developing

Figure 7.1. **Contribution of forest to GDP, and ratio of forest exports out of total exports, for selected countries**



Source: Lebedys, A. (2004).

countries where forestry accounts for more than 10% of total exports, and 10 more countries where forestry makes up over 5% of exports. In countries such as Cameroon, the Central African Republic and Liberia, forests contribute from nearly 30% to more than 40% to national exports (Figure 7.1). Forestry contributed to exports worth USD 3 billion in Africa, USD 6 billion in Latin America and the Caribbean and USD 16 billion in the developing countries of Asia and the Pacific (Lebedys, 2004; World Bank, 2004a).

7.2.3. Forests and employment

Forestry provides more than 10 million jobs in developing countries (Dubois, n.d.). In several African countries such as Swaziland, Gabon, Equatorial Guinea and South Africa, the formal forestry sector contributes around 1% or more to total formal employment (Lebedys, 2004). The formal forest sector in Africa, including forest activities, woodworking and the pulp and paper industry, employs some 550 000 people (Whiteman and Lebedys, 2006).

Informal sector employment in most developing countries largely exceeds that in the formal sector, providing employment for another 30 to 50 million people. Additionally, unpaid subsistence work primarily for fuel wood harvesting represents about 13 million full-time job equivalents in developing countries (ILO, n.d.).

7.2.4. Subsistence income from forests

The value of non-commercial goods and services provided by forests may well exceed that of the commercial output. Forestry is often a very important element of rural economies, providing complementary income to agriculture and offering jobs in regions where few other employment opportunities exist.

About 1.2 billion people in developing countries rely on agro-forestry farming systems that help sustain agricultural productivity and generate income (World Bank, 2004a). A quarter of the world's poor and over 90% of the people living in extreme poverty depend on forests for some part of their livelihoods. An estimated 400 million people live in or near forests and rely heavily on forests for everyday subsistence. The 60 million indigenous people living in the rainforests of Latin America, Southeast Asia and West Africa who almost entirely depend on forests belong to this group (Patosaari, 2005).

Forests often provide a safety net to the poor and the landless, because the harvesting or hunting of their products do not require strong rights to the land, as opposed to agriculture. As much as 20% of the daily livelihood needs for rural families comes directly or indirectly from forests, including 20% of the disposable income used by the landless and poor families to pay for school fees and meet other family needs (World Bank, 2004a). Charcoal and fuel wood are a main source of cash for poor people living in and around forests (FAO, 2006; FAO, n.d.). Apart from timber, charcoal and fuel wood, forests provide a wide range of non-timber forest products, *e.g.* wild fruits and roots, grasses, vines, mushrooms, medicinal substances, gums, honey, game, meat, etc. Some 1 billion people worldwide depend on drugs derived from forest plants for their medicinal needs (World Bank, 2004a). It is important to note that while strong rights to land are not essential for such forest related benefits, legal rights to the forest must be compatible with commercial harvesting of both timber and non-timber forest products by local people. Such access rights must be designed to prevent over-exploitation of the resource and to ensure worker and environmental protection while simultaneously allowing for local profitable exploitation of forest resources.

7.3. What is the potential for forests to lift the poor out of poverty?

Forestry can contribute to growth, and is clearly important for the livelihoods of poor people. But while forest products are vital to maintain incomes and prevent further vulnerability, can forests actually provide a way to escape from poverty? For forests as with other resources, the challenge is to: *i)* generate growth; *ii)* ensure that the poor benefit from growth; and *iii)* sustain growth by managing the forestry resource.

7.3.1. Increasing growth and the role of forests

Ensure that large scale forest harvesting is not subsidised. Timber extraction and processing are often linked to the political elite who benefit from artificially low log prices and subsidised credit. In the medium term, low timber prices encourage excessive processing capacity, which eventually will destroy the viability of the industry. In many countries, however, reforms are underway to improve the management of forests.

Increase public revenues from forests. Forests have a significant potential to generate public revenues, but this potential is hardly realised. Profits generated by timber extraction are mostly captured by the private sector, with limited benefits for society at large. In Africa, only 3.7% of the value added from forestry activities was paid as forestry charges during the 1990s, while 95% of value added from forestry on the continent was paid to investors (*i.e.* holders of felling and forest concession licences) (Whiteman and Lebedys, 2006). An important reason for low revenue generation is failure in revenue collection. Many countries distribute valuable natural forests for political gains while ignoring revenue generation, as in Cambodia and Indonesia. The World Bank estimates the annual revenue loss from failure to collect taxes from forest concessions at more than

USD 5 billion. In addition, the annual market value of losses from illegal cutting of forests is placed at over USD 10 billion (World Bank, 2004a).

But forest revenue problems can be corrected by more appropriate forest pricing policies for timber and forest concessions, coupled with improved forest fee design, collection and enforcement. Some countries manage to generate higher public revenues. Governments in Brazil and Indonesia capture less than 15% of potential rent, while this percentage reaches around 30% in Gabon and Laos (OECD, 2005). Countries such as Cameroon and Ghana are raising forestry prices through auctions and timber taxes, despite some resistance. In Cameroon, national fiscal revenues from forestry grew from USD 3 million to USD 30 million from 1995 to 2001, and now provide 25% of national tax revenue. Furthermore, local community returns grew from negligible amounts in 1995 to more than USD 8 million in 2002 (UNEP, n.d.; Cassells, 2003).

Increase value added in the forest industry. This can be done by encouraging value-added processing and investment in tree plantations focusing on the most commercially viable species. The USD 327 billion annual global trade in forest products in 2004 remains largely dominated by industrialised countries (FAO, 2007a). Africa still mostly exports unprocessed logs from natural forests. While Asia continues to increase the number of forest plantations, Africa, despite favourable conditions, continues to have very few. South Africa is the exception, and its private plantations are certified for sustainable management.

7.3.2. Ensuring the poor benefit from growth from the forestry sector

Ensuring that forest concessions do not harm the poor. Despite growth in participatory forestry in the forest-rich tropics, the area reserved for commercial logging continues to be much larger. Many of these concessions impact negatively on the poor and are not covered by properly defined and enforced management plans.

Channelling revenues raised from forests to pro-poor expenditures. In addition to allocating resources to pro-poor public services, *e.g.* in the health and education sector, this can be achieved by allocating some of the revenues received from the forest to local authorities in forested, low-income areas (OECD, 2005). In Bolivia, municipal governments retain 25% of forestry fees, while in Guatemala municipalities retain 50% (Contreras-Hermosilla and Ríos, 2002; Ferroukhi and Echeverría, 2003).

Enhancing opportunities for small and medium-sized forest enterprises. Most forestry value-added production is capital-intensive and skill-intensive technology. It also requires improved access to transport infrastructure, overcoming local purchasing monopolies, support with certification and new sources of demand. Poor producers often benefit from grouping themselves into associations, in order to negotiate better terms for the sale of their products, as was the case in Latin America and in some African countries, such as Uganda and South Africa. For example, in South Africa, poor households are gaining income as out-growers (Box 7.1). Access to technologies and information about lesser-known but commercially valuable wood species also helps.

Improving institutions and policies to protect and secure the forest assets of the poor. To manage the natural forest and plant trees on private land, poor people need secure tenure as provided by India and Nepal's forest programmes. Over 20% of forest area in eastern Nepal now has some control by poorer households (Mayers, 2007). Countries such as Guatemala and Laos are experimenting with community logging concessions.

Box 7.1. **Outgrower schemes in South Africa (2000)**

South Africa has the most developed industrial pulpwood industry in Africa. Some 19 000 households are involved in small-scale commercial timber production, mostly in KwaZulu-Natal Province. Most have been contracted by two international pulp and paper companies (Sappi and Mondi) to grow eucalyptus. The total planted area is about 43 000 hectares. Although this industry started in the 1980s as a corporate social responsibility exercise, the partnership has become good business, allowing economies of scale in plant operation. The arrangements also bring significant economic benefits to the small-scale farmers who receive the inputs and guaranteed harvest in six to seven years. It is estimated that the outgrower schemes contribute 12% to 45% of the income needed to remain above the "abject poverty line".

Source: Mayers and Vermeulen (2002).

7.3.3. Sustaining forests for pro-poor growth

Loss of natural forests has in some cases imposed high social costs on the people dependent on them, as in Cameroon and in China, and has been partly linked to incidences of large-scale flooding. As a result, some countries such as China, Thailand and Sri Lanka have banned commercial logging altogether in certain areas. Such drastic measures should be carried out in ways that minimise the impact on the poor.

Pro-poor forestry management should reconcile the different functions of forests. A first step in this respect is to distinguish between forests which can be used for timber extraction purposes and those which are too fragile, depleted or otherwise degraded; and to recognise those on which many landless poor or indigenous communities depend, as well as those with high cultural, social and spiritual value which should be preserved from commercial-scale, or even any, logging activities.

In many forest-rich, low-income countries, the priority is to foster a shift towards sustainable logging techniques (including "reduced impact logging") and sustainable forest management as quickly as is economically viable. Enforcement of regulations is often deficient or undermined by large-scale corruption. But there are some hopeful examples of these problems being addressed, such as recent crackdowns in Indonesia and parts of Brazil's Amazon.

Fiscal instruments can be important in sustaining the resource base. In many countries, timber prices and forest fees do not adequately reflect the captured rent and externalities associated with logging. This can encourage excessive processing capacity and decreased revenues for the government. Forest revenue problems can be corrected by more appropriate forest pricing policies for timber and forest concessions, coupled with improved forest fee design, collection and enforcement.*

Pro-poor management of natural forests can be complemented by promoting plantations on degraded lands. Plantations provide an increasing volume of harvested roundwood (wood in its natural state as felled, with or without bark). It may be round, split, roughly squared or in other forms, amounting to 35% of the global harvest in 2000 (Millennium Ecosystem Assessment, 2005). Plantations can be very productive with average yields of 7 m^3/ha compared to 2 m^3/ha from natural forests. But plantations should

* These questions are examined in detail in, for example, Leruth *et al.* (2001).

not be on lands that are important for the livelihoods of the poor. Furthermore, fostering plantations should not lead to increased conversion of natural forests where soil, climatic and other factors are not conducive to plantations (Box 7.2).

Box 7.2. **Can forest conversion be economically beneficial and pro-poor?**

Whether forest conversion is beneficial or harmful depends on what happens after such conversion. Planned conversion of natural forests to tree crops (cocoa, coffee, oil palm, rubber) or tree plantation can yield long-term economic benefits provided that soil, climatic and other factors are conducive to such crops. Conversion of natural forests to agriculture (*e.g.* soybean) can also be economically beneficial provided that the soils are suitable. But forest soils are often very poor and unable to sustain agriculture on a long-term basis. In such cases, conversion to agriculture generates a host of negative externalities (notably soil erosion) and does not represent a sustainable, let alone pro-poor, option.

In other cases, forest conversion is not planned but conducted illegally by landless farmers following logging operations. Deforestation is primarily caused by extending land for agriculture. This often causes irreversible land degradation and does not represent a long-term sustainable option. The World Bank estimates that 83% of the area of the Amazon is unsuitable for agriculture and ranching and that continuation of these activities in forests will result in extremely low returns from this type of land use, as well as permanent loss of the forest areas (World Bank, 2004a).

Box 7.3. **The potential for harnessing carbon markets to support forestry development**

There is increasing global interest in the connections between climate change mitigation, forest management and carbon markets. In fact there is growing recognition that forests can play an important role in all three types of mitigation-GHG emission reduction, enhancement of carbon sinks and carbon substitution. The following forest management options correspond to these mitigation options:

- enhancement of carbon sinks: afforestation, reforestation (as defined in the Marrakesh Accords) and forest restoration which is enhancement of sinks in degraded forest areas;
- GHG emission reductions from deforestation and forest degradation: sustainable yield management and forest conservation;
- carbon substitution through increased use of wood products or bio-energy plantations.

Under the current regime for the first commitment period of the Kyoto Protocol only the Clean Development Mechanism (CDM) provides a formal mechanism to undertake forestry related projects in developing countries. Two forestry activities are eligible within the CDM: afforestation and reforestation (A/R CDM). However, due to the extremely complex system developed for the registration of these projects, the sequestration potential is underutilised. Indeed by April 2008 only one A/R CDM project has been validated.

Forest restoration as a mean for sequestering carbon has not yet been included in any formal market mechanism.

Box 7.3. **The potential for harnessing carbon markets to support forestry development** *(cont.)*

At COP 13 in Bali, and after a two years process, the UNFCCC Parties agreed on promoting a piloting phase for exploring the potential of Reducing Emissions from Deforestation (and Forest Degradation) – REDD. Experiences from pilot activities at the national and sub-national levels should provide enough knowledge for making decisions on REDD for a post 2012 regime. Considering that over 40% of the emissions from deforestation and forest degradation is directly caused by poverty and that in these cases the opportunity costs of reducing these emissions is relatively small, around USD 3 per ton CO2e, it is clear that even a conservative carbon payment for avoided deforestation has significant potential for promoting sustainable development.

In the case of carbon substitution the situation is different for the promotion of wood for bio-energy as for the use of wood products. While the use of bio-fuel plantations in energy CDM is recognized, the use of wood products for substitution is not recognised neither for industrialized countries (Annex I) nor in the CDM.

Altogether forestry has significant potential as a CC mitigation option, comprising:

- REDD: 3.76 GtCO2e per year, about 77 GtCO2e until 2030.
- Afforestation/Reforestation: min. 18 GtCO2e until 2030.
- Forest Restoration: estimated to 117 GtCO2e until 2030.
- Natural Forest Management of existing production forests: 6.6 GtCO2e until 2030.

The role that carbon markets can play in the context of development cooperation thus depends on a number of key elements:

- market conditions (access, price, liabilities);
- ensuring enabling conditions (policies, legislation and capacities for law enforcement);
- carbon accounting systems (with the challenge to design an accurate by using existing data and capacities).

Source: Blaser and Robledo (2008); Chomitz (2006). Blaser J. and C. Robledo (2007). *Initial Analysis on the Mitigation Potential in the Forestry Sector*. Report prepared for the Secretariat of the UNFCCC. August 2007. *http://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/blaser.pdf*.

7.4. The politics of increasing the role of forests to promote pro-poor growth

While many of the policies and investments needed for forests to sustain pro-poor growth are known, they are often not implemented. This section identifies how to make change happen and provides some examples of how this has taken place. It demonstrates what coalitions are needed to make investments in forestry and what management improvements need to happen, including the empowerment of the poor and the supporting role of donors.

7.4.1. Making large-scale commercial forestry sustainable and pro-poor

In many low-income countries, natural forestry resources represent a valuable commodity. However, these are often distributed on a patronage basis for political gains. Revenue generation for the treasury tends not to be an objective. This is evident in many forest-rich countries such as Cambodia, Ghana, Indonesia, Myanmar, Cameroon, the Central African Republic and Liberia (WRI, 2000). The timber-processing industry is often

closely tied to the political elite and benefits from artificially low log prices and subsidised credit.

There are some countries, such as Cameroon and Ghana, where reforms are now being attempted to raise forestry prices through auctions and timber taxes, but these face major resistance. In countries such as Ghana and Indonesia where the forest industry is largely run by nationals, the resistance is domestic, but in many other places, such as many African countries, commercial logging is conducted by foreign firms.

There are one or two exceptions, demonstrating that large-scale commercial forestry can be sustainable. Inspiration Furniture is a Malaysian-based moulding and garden furniture exporter with sales of USD 20 million, which received the Forest Stewardship certification in 2001, and saw profits increase by 5% with new demand in Germany and elsewhere in Europe (FSC, 2004). Latin America shows signs of having some of the most pro-active private sector operators, such as Bolivia. The country is among the most forested countries in Latin America and now has 25% of its forest area certified. This is the highest proportion of any tropical country (Box 7.4).

Box 7.4. **Bolivia is a world leader in certified timber**

The recent commitment by the Bolivian timber company, CIMAI/IMR to certify 300 000 hectares of its forests will bring Bolivia's certified forest area to over 2 million ha. The company already has several thousand hectares of certified forests, which has led the marketing director to state: "*Without FSC we would not have a business today*." This increase means that 25% of Bolivia's forest area will be certified by the Forest Stewardship Council – the highest national coverage of any tropical country. The certified forests, mostly in the southwestern Amazon, include 13 forest concessions on state lands, two private properties and one indigenous communal land. Certification has helped generate USD 16 million a year in exports especially to the American and European markets where demand for certified timber is strong. The environmental and economic benefits of certification include product diversification. Before 1985, 85% of wood products were of mahogany, but by 2004, there was a marked growth in demand for FSC-promoted products and exports of abundant, but lesser known, species. The FSC standards also protected the rights and welfare of neighbouring people. The certification process was helped by a decade of the most progressive forest laws in the region.

Source: IUCN (2005); FSC (n.d.).

7.4.2. Create opportunities for small and medium sized producers

While forest management and tree-growing by smallholders can potentially produce substantial income, it requires access and land tenure security, which the poorest people tend not to have (FAO, 2003). Furthermore, there are strong asymmetries of information, power, and organisation between the beneficiaries of deforestation and those who bear its burdens. The diffuse interest groups favouring forest conservation find it hard to organise themselves to counterbalance the concentrated interests of forest degradation. Therefore, political challenges over access rights, transparency and accountability must be addressed. In particular, constituencies for conservation and better governance should be supported; public monitoring and disclosure of forest conditions and management should be improved; forest and agricultural products should be certified; and more flexible

approaches to environmental regulation should be introduced. These measures can help diverse groups to organise, to check abuses of power and to cut the costs of reaching agreements for pro-poor forest management.

There is already some positive experience in South Asia, Latin America and Africa from which lessons can be learned. As a result of extensive redistribution of forest resources in developing countries, 22% of the total forest area in these states is now owned by, or reserved for, communities and indigenous groups (Scherr, White and Kaimowitz, 2004). Again, this does not guarantee that poverty will be alleviated, but it may improve the chances. One positive example is the development of extractivist reserves in Brazil (Box 7.5). Driving these positive developments are innovative coalitions for reform that bring together the poor themselves, often supported by civil society actors, and in some cases, international pressures from donors, NGOs and consumers.

Box 7.5. **Extractivist reserves in Brazil: Sustaining pro-poor growth**

Some of the most impoverished groups in Brazil live in the forests. Rubber-tappers live isolated deep in the forest, depending on rubber and other forms of "extractivism". They are largely migrants from the northeast, whose families tapped rubber during the early part of the 20th century. However, unable to compete with Asian rubber, the government decided to shift to other forms of development, such as agriculture, cattle-ranching and mining, leaving the tappers marginalised. The return of Brazil to democracy in 1985 helped precipitate major efforts by marginalised groups in Brazil to become organised. Indigenous Indian groups formed the Indigenous Peoples Union (IPU). At the same time, the National Council of Rubber Tappers (NCRT) was formed with Chico Mendes as its first president. In 1986 the NCRT joined the IPU to create the Alliance of Forest Peoples. The rubber-tappers helped stimulate calls for what have become known as "extractive reserves". With considerable civil society support, both within Brazil and internationally, and pressure from the World Bank, the government was forced in 1995 to create almost 900 000 ha of extractive reserves. As of 2000, this had grown to 16 reserves covering 3.4 million ha with more under discussion. However, there are still challenges in making the reserves work. In the 1990s these included middlemen who dominate the extractivist economy and falling rubber prices. However, by 2000 some of the early challenges were being overcome as local families shifted into more diversified agricultural I sources of income and then benefited from rising rubber prices.

Source: Brown and Rosendo (2000) and Ruiz-Perez *et al.* (2005).

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PART II

Chapter 8

Wildlife and Nature-Based Tourism for Pro-Poor Growth

Nature-based tourism is one of the fastest growing sectors of the global tourism industry. At the same time, it is one of the few export or service sectors in which poor countries can develop a clear comparative advantage, given that they often possess a rich natural resource base. This chapter outlines strategies for maximising the poverty impact of nature-based tourism. It also explores the significance of the international wildlife trade and its potential for pro-poor growth, highlighting policies to combat over-exploitation and illegal trading in wildlife.

8.1. Overview

Wildlife performs an important safety net role for many poor people, *e.g.* providing food, fibre and medicines, and can also be a source of wealth creation. An estimated 150 million people (one-eighth of the world's poorest) perceive wildlife to be an important livelihood asset (African Conservation, 2003).

Nature-based tourism holds high potential for wildlife-based economic growth. It is one of the fastest growing segments of the global tourism industry, and one of the few export/service sectors in which poor countries have (or can develop) a clear comparative advantage as a result of their often rich natural resource base. Trophy-hunting can be a particularly lucrative sector of this industry for some countries, generating significant public revenues in countries such as Tanzania. Nature Tourism has also been an important source of income for Small Island Developing Countries, particularly in the Pacific.

Wildlife trade also deserves far greater attention – generating an estimated USD 15 billion per annum worldwide, excluding large-scale commercial trade in fish and timber. But overexploitation of species and illegal wildlife trade can be economically and ecologically very damaging. Better management, regulation and controls are needed to realise the potential of wildlife trade for pro-poor growth.

8.2. Wildlife and poverty: Safety nets and wealth creation

The benefits of wildlife management are rarely fully-valued in national accounts. Many poor countries have great biodiversity within their borders, yet appear to be unable to "capture" this value in ways that promote sustainable economic flows into the future. Indeed, in many poor countries the economic value that these natural resources generate for the country contrasts starkly with the political priority given to ensuring the sustainable conservation of these resources.

Wealth from wildlife can come from a number of sources including:

- nature-based tourism;
- investments by conservation organisations in protection of globally valued species and habitats;[1]
- trophy-hunting;
- game-ranching;
- farming;
- wildlife trade – or zoo, pet, aquarium fish, medicinal and food markets;
- "bio-prospecting" for pharmaceuticals.

This chapter focuses on tourism as the industry with the greatest potential for wildlife-based economic growth. In Kenya, for example, wildlife tourism is estimated to generate more than 100 times the revenue of all other non-tourism wildlife enterprises combined (Ashley and Elliott, 2003). Not all of this wealth or the associated rents

necessarily accrue to the poor, or, indeed, to agents in the destination country. Trophy-hunting is part of wildlife-based tourism, but dealt with separately in this chapter, given its specific characteristics and its economic benefits which are considerably higher than those from wildlife viewing. Finally, issues related to wildlife trade are addressed, given the scale of this global industry.

8.3. Contribution of nature-based tourism towards growth and the economy

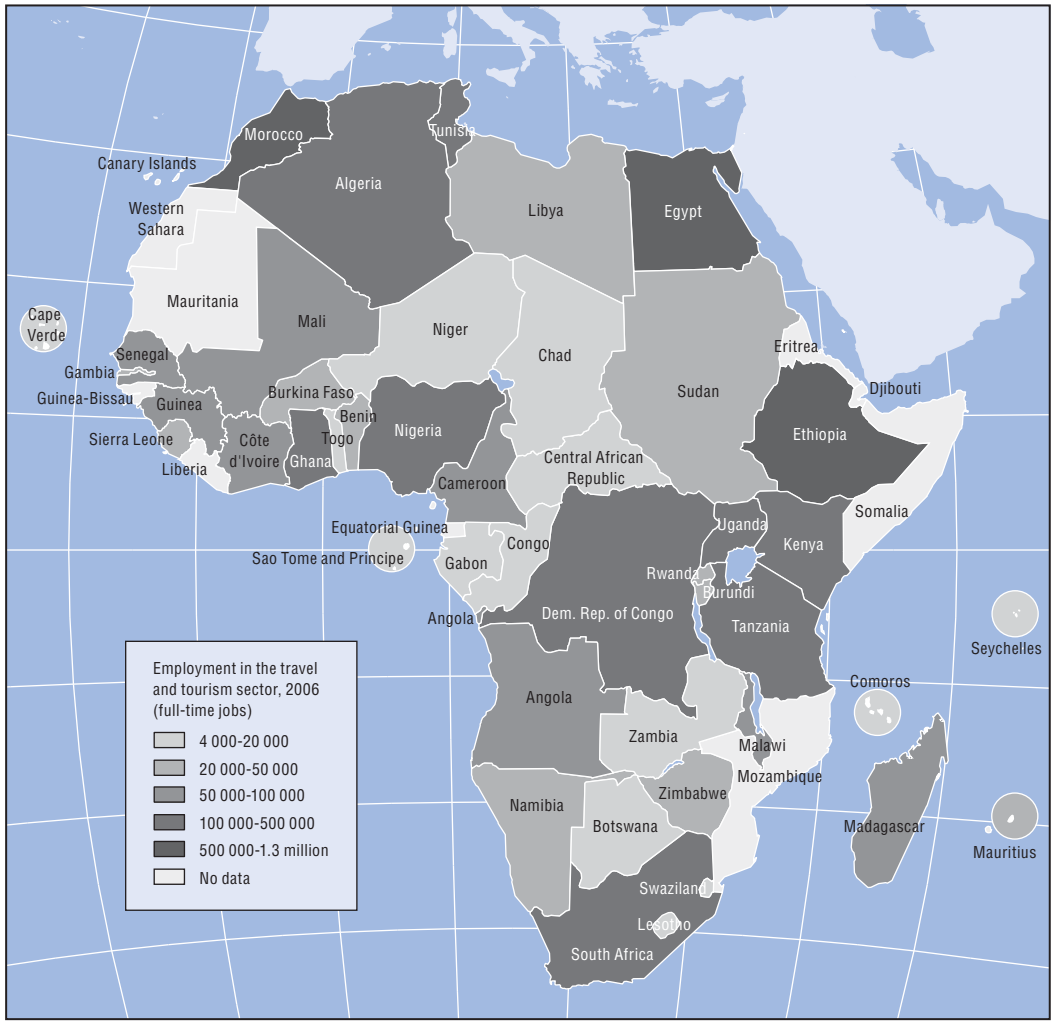
Tourism is often described as the world's biggest industry because of its contribution to global GDP and export earnings, the number of people it employs and the number of people it involves. This industry is growing fastest in developing countries. In Africa, where tourism is highly dependent on the natural and cultural environment, tourism as a percentage of total African exports grew from 2% to over 11% between 1980 and 2003. In countries such as Ethiopia, Tanzania and Gambia, tourism now provides 23%, 28%, and 30% respectively of national exports. Indeed, many countries in which tourism is an important industry are among the poorest and least developed in the world (ODI, 2006).

Furthermore, tourism is an efficient generator of employment in developing countries (ODI, 2006). About 6.3 million people work in the travel and tourism industry in Africa. However, since travel and tourism touches all sectors of the economy, its real impact is even greater. In Gambia, for instance, 30% of the workforce depends directly or indirectly on tourism. In small island developing states, percentages can range from 83% in the Maldives to 21% in the Seychelles and 34% in Jamaica (UNEP, n.d.).

Growth in tourism provides a direct increase in income among those who supply hotels, transport, food and other such services, as well as to the host country through increased tax revenues. It then provides indirect benefits to others through the spending of direct income. While increases in tourism revenue lead, eventually, to higher national income, the direct consequences for the distribution of this extra income among, and within, households are not necessarily the most favourable for sustainable poverty alleviation, and may even increase poverty for some. Increasing the poverty impact of tourism generally requires some form of policy intervention. It is also important to remember that even within relatively poor communities (by developed country standards) there will be a continuum of income from the very poor to the relatively wealthy.

Nature-based tourism is one of the fastest growing segments of the global tourism industry. As a result, it is one of the few export/service sectors in which poor countries have (or can develop) a clear comparative advantage as a result of their often rich natural resource base. Nature-based tourism encompasses a wide range of activities (trekking, wildlife viewing, diving and so on) in an equally wide range of destinations (islands, deserts, forests, mountains, savannas). In addition, opportunities exist to capture a larger portion of the total value of tourism for national economies visited by tourists.

Figure 8.1. **Employment in the travel and tourism industry in Africa, 2006**



Source: World Travel and Tourism Council (2006), *Travel and Tourism Climbing to New Heights – League Tables*. *http://wttc.org/tsa1.htm*, accessed 2 October 2006.

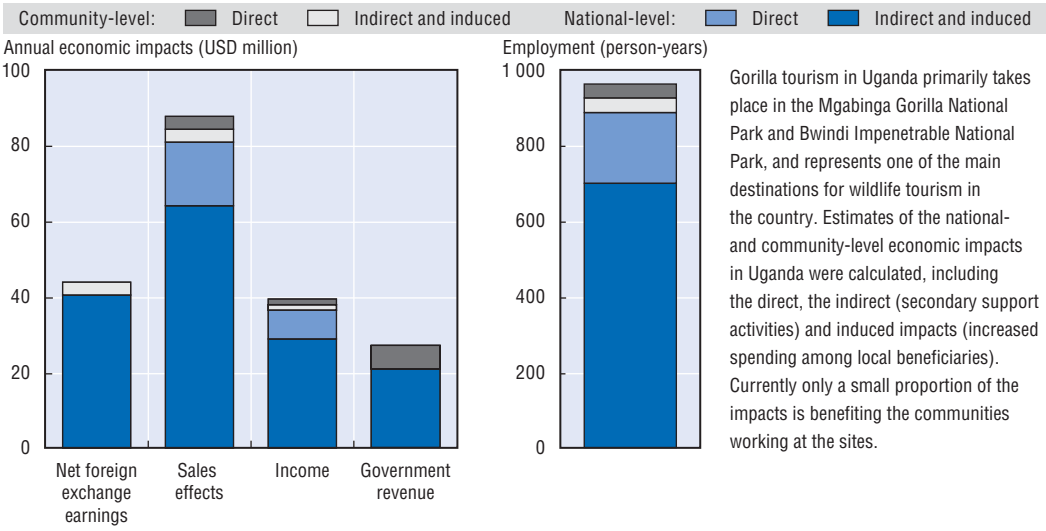
8.4. What is the potential for nature-based tourism to lift the poor out of poverty?

Nature-based tourism is unlikely to address the plight of the most disadvantaged/marginalised people. Nevertheless, tourism does appear to have very significant *potential* for pro-poor growth as noted below:[2]

- It brings consumers right to the product, generating huge marketing opportunities for local producers of goods and services.
- It creates demand for locally produced inputs, and this can contribute to economic development through indirect multiplier impacts – particularly in agriculture and fisheries.
- It provides opportunities for off-farm diversification.
- It provides relatively labour-intensive opportunities. It is often significantly more labour-intensive than other non-agricultural sectors.
- It employs a relatively high proportion of women and can contribute to gender equality.

- It is one of the few industrial sectors that use "master-plans" enabling governments to have direct influence on its domestic development by local stakeholders.
- Tourism products can be built on, and thereby help to preserve, natural resources and culture. These are assets that some of the poor have, even though they may lack financial assets. Adequate compensation for protection of land for nature-based tourism can serve as a safety net for some of the poorest communities.

Figure 8.2. **Economic impacts of gorilla tourism in Uganda**



Source: Moyini, Yakobo and Uwimbabazi, B. (2000). Analysis of the Economic Significance of Gorilla Tourism in Uganda. International Gorilla Conservation Programme (IGCP). *www.mountaingorillas.org/files/ourwork/Economics%20of%20Gorilla%20Tourism%20in%20Uganda.pdf*, accessed 4 October 2006.

The key issues to make nature tourism more pro-poor include the *form of tourism* (wildlife viewing, scuba-diving, trekking, and international, regional or domestic), the extent of *access to tourists by local people,* and the *volume of tourists*. These three factors define the opportunities available for pro-poor growth. If tourists arrive at a destination in the evening, drive straight to the hotel and eat dinner without venturing out, and then in the morning pack and depart by coach to visit a state-run protected area before driving on to their next overnight stop, then there will be very few opportunities for poor producers to sell to tourists, whatever volumes the tourists arrive in. "Enclave" tourism may bring limited benefits for surrounding areas.

Regardless of location, the contribution that tourism can make to rural economic development will depend on the extent to which tourist demands can be locally met. In areas with limited rural economic activities, even basic commodities tend to be trucked or shipped in, and high levels of leakage[3] are common. However, current destinations hint at future opportunities, with successful tourism sector development providing a hub for future entrepreneurs to build upon.

The benefits from tourism must be greater than the losses borne by the poor, but this is not always the case. Local communities west of the Serengeti National Park in Tanzania have suffered losses of USD 1 million (USD 110 per household) because of damage by wildlife, but received only USD 75 000 (USD 8 per household) in compensation out of the very substantial revenue generated from tourism. In Bhadra Tiger Reserve in India,

compensation for livestock loss caused by tigers amounted to just 5% of the livestock value, and compensation for crop losses due to elephants was just 14% (Norad, 2007). However, there are examples where the local people could improve their livelihoods by establishing protected areas for tourism (Box 8.1).

Box 8.1. **Pro-poor growth in Indian protected areas**

India has, like many countries, faced challenges of how to reconcile local livelihoods with the establishment of protected areas. The approach adopted is known in India as eco-development and since the late 1990s many protected areas have had eco-development committees (EDC), often supported with global environment facility (GEF) financing. A confederation of these committees was created in 2002. While these EDCs have a mixed track record, there are some definite successes.

One such success is Periyar Tiger Reserve in Kerala, receiving 400 000 tourists a year, and able to generate sufficient incomes to support financial livelihoods and provide other related benefits for the neighbouring villagers. For instance, a shop has been established and villagers work as guides and forest stewards. Interestingly, the overall incomes of residents from eco-development are still below what they used to earn from smuggling and other illegal activities they used to engage in previously. Yet legitimacy breeds security, and the standard of living is higher today because local residents are no longer under the threat of being pursued by the police and under the coercive influence of middlemen and moneylenders.

Source: Kothari and Pathak (2004).

Strategies for maximising the poverty impact of tourism include:

- *Clear land rights for the poor*. It is crucial to ensure that rights and responsibilities for the poor are clearly delineated and enforceable. Clear ownership and user rights over land allow private-sector land managers and residents to make locally relevant choices over the form of tourism, and the structure of contracts, including the distribution of any benefits accrued.
- *Promoting local employment and the skills required*. Many tourism businesses employ expatriate workers, particularly in managerial positions. Nature tourism offers particular opportunities for local people as it relies on local knowledge and skills. A local workforce also enhances the feeling of authenticity that nature tourists seek. Unlike mass tourism, the success of nature-based tourism frequently depends on skilled guides and hosts. Workers often become an enterprise's most valuable asset and frequently play a major factor in repeat visits. Governments and trade associations need to invest in both vocational training and the promotion of mentoring. Policies that include individuals from indigenous, minority or disadvantaged groups are also fundamental.
- *Opportunities for direct sales of goods and services to tourists*. Tourists are often shielded from local people, *e.g.* beaches are fenced off for private use, hotel grounds are off-limits to local people, tours have fixed itineraries and stopping points. Special efforts have to be made to avoid such enclave tourism and to maximise complementary spending.
- *Sourcing goods and services from local suppliers*. Tourism enterprises can help stimulate linkages with other economic sectors – particularly agriculture, and can support local businesses by outsourcing services such as laundry, security, taxis and so on. For example the various "adopt a farmer", and "eat local" schemes that exist in the Caribbean can be adapted in various ways in other localities and contexts.

- *Supporting local spin-off businesses*, *e.g.* local guiding businesses, community campsites, craft markets, and promoting small and medium enterprises. Nature-based tourism is particularly suited to small and medium-sized business involvement because of the close contact between the clients and the hosts, and the need for flexible working patterns. Successful SME development can be aided through the provision of credit facilities and technical support. One key issue is to avoid over-regulation, specifically with respect to foreign currency and imports. Entrepreneurs need to be able to react to changes in the market.
- *Encouraging voluntary giving* by tourists or tourist business development. This was a major benefit observed in Sri Lanka and Thailand after the 2004 tsunami.
- *Investing in tourism infrastructure* that also benefits poor people (roads, communications, healthcare etc).
- *Building "pro-poor" conditions into tourism developments*, *e.g.* as criteria in tender documents, as a tax on tourism profits, gate fees, wildlife auctions, and market-based trophy fees. Simply making benefit-sharing a precondition of sustainable wildlife investment is insufficient. Great care is needed in designing the schemes and ensuring that the asset base of the poor is enhanced rather than reduced by the schemes[4].
- *Encouraging participation of poor people in tourism planning*, *e.g.* through the master planning process.
- *Developing partnerships between tourism investors and the poor* (as owners or rights-holders over land and wildlife resources). Successful examples of this include building pro-poor criteria into concessions for safari lodges on community-owned land in Namibia and South Africa. The real success is seen in Namibia where community members have taken a collective decision over a mix of financial promises and collective preference for an individual hunter.

Community-based wildlife conservancies in Namibia brought a range of impressive economic benefits to local communities, and many of these benefits reached the poor. First, important economic benefits could be realised through the development of the conservancies. Since the first conservancies registered in 1998, cash income, wages, and in-kind benefits (such as game meat) have rapidly escalated, and reached nearly USD 4 million, more than NAD 26 million (Namibian dollars) in 2006. Additionally, the private sector participants generated an estimated USD 13.9 million in revenues. The total estimated net economic benefits contributed by the conservancies and the related community-based natural resource management programme to the Namibian economy climbed to USD 27.5 million. Conservancy-related activities, including tourism, have provided 547 full-time and 3 250 part-time jobs. Second, in some cases, the poor have gained proportionately more than the less poor. In other cases, the benefits have been neutral with respect to income groups. Third, women's livelihoods and status have improved. Women fill almost 3 000 of the new part-time jobs, and more than half the full-time posts. An analysis of the conservancies shows that such schemes can be designed to be at least "poor neutral" but with the possibility for them to be pro-poor as well (Pearce, 2005; WRI, 2005; WWF *et al.*, 2007).

Many of the above are strategies that any tourism business can decide to adopt. Others will require a supportive policy and regulatory framework (see below).

8.5. Trophy hunting

Trophy hunting is an additional means of generating revenues from wildlife, and can be conducted as a complement or alternative to nature based tourism. It represents a large and growing industry in several parts of Africa. For example, trophy hunting generates between USD 65.6 million and USD 137 million a year in South Africa, USD 18.5 million a year in Zimbabwe and USD 12.6 million a year in Botswana. These revenues provide economic justification for wildlife as a land use over vast areas, most of which are additional to protected area networks (Lindsey *et al.*, 2006).

Despite the scale of the industry, little is known about the importance of hunting revenues in creating incentives for conservation or the impact of trophy-hunting on wildlife populations. This lack of information renders some governments, conservationists and foreign NGOs uncertain about the value of the industry for pro-poor growth and conservation, and opinion concerning trophy hunting has become polarised.

Advocates of trophy hunting point out that trophy hunters pay higher fees per client than conventional tourists. Therefore, revenues can be generated from lower numbers of people, resulting in potentially less environmental impact. Furthermore, trophy hunting generates revenues for conservation in areas that may not be suitable for tourism, such as those lacking attractive scenery or high wildlife densities. Additionally, trophy-hunters may also be less easily dissuaded than conventional tourists from visiting countries experiencing political instability.[5]

But a number of problems limit the potential of trophy hunting for pro-poor growth and conservation. These include the inequitable distribution of hunting revenues, inadequate involvement of communities, corruption and ecological problems such as setting quotas in the absence of adequate population data and overshooting of quotas. See also the box below on trophy hunting in Tanzania.

Box 8.2. **Trophy hunting in Tanzania**

The trophy-hunting industry in Tanzania generated an estimated taxable income of USD 28 million in 2001, out of which the wildlife division of the ministry of natural resources and tourism acquired USD 10 million in revenues. The average income to the wildlife division per hunting client is approximately USD 7 000. Income generation from all hunting areas of Tanzania is approximately USD 40/km^2, while it reaches approximately USD 70/km^2 in the Selous Game Reserve.

But the pro-poor impact of the wildlife industry is limited by an inefficient system of allocating hunting concessions and problems with quota management, poor rates of recovery of revenue, and an only limited participation of communities in the management of the hunting sector. Poaching remains a problem in some areas, notably outside the game parks and reserves. Furthermore, there is strong resistance to reform the sector by those who profit from the current situation.

Source: Baldus and Cauldwell (2004); DPG Forest Sector Policy Brief (document provided to the Development Partners Group of Tanzania (2006), *www.wildlife-baldus.com/tanzania.html*, accessed in May 2007.

8.6. The politics of increasing the role of nature tourism to promote pro-poor growth

The suite of policies that are required to promote nature tourism as a contributor to pro-poor growth include many that are applicable to all economic sectors (*i.e.* macroeconomic stability, good governance at all levels and a stable political environment). Stability is particularly important for the tourism sector; a single incident that leads to an increased perception of danger can significantly reduce visitor numbers.

Nature tourism needs to receive greater attention among key government agencies. The role of tourism is frequently absent or marginalised in sectoral (wildlife, agriculture, poverty) plans and *vice versa*.

Experience indicates that success in facilitating a genuine change of tourism to benefit poor people is complex and context-specific. Developing countries often require both financial investment and transfers of technology and skills to begin development of their tourism sector, often excluding the poor in the initial stages of development. Yet, as the tourism sector develops, greater opportunities exist to ensure ongoing development contributes to pro-poor growth.

The tourist industry, especially initially, tends to be closely linked with property-price speculation, high-risk investors and elite capture. Typically large-scale tourism businesses have greater political access than SMEs. There is also a convenience aspect for all levels of government in working with industry participants with good investment potential and the existing skills to develop a successful product. Yet experience in southern Africa has shown that NGOs can wield commensurate political influence, while combining wider developing country priorities, such as poverty alleviation, with tourism development.

8.7. Wildlife trade

Wildlife trade is any sale or exchange by people of wild animal and plant resources. Fisheries and timber dominate the international wildlife trade in terms of volume and value. Nevertheless, this chapter does not consider trade in fisheries and timber, because it is already covered elsewhere in the report.

8.7.1. The scale and significance of the international wildlife trade

Most wildlife trade is within national borders, but there is an increasing volume of wildlife in international trade. A large proportion of the harvest of wildlife products is for domestic rural to urban trade, covering a variety of products, *e.g.* charcoal and wild meat.

While international trade statistics do exist – through customs data and reports to the Convention on International Trade in Endangered Species (CITES) – these are only broadly indicative of the global situation since much trade is unregistered or unreported, with quantity routinely collected, but not value. Iqbal (1995) values trade in NWFPs (non-wood forest products) at over USD 11 billion per annum.

8.7.2. Maximising the pro-poor potential of the wildlife trade

The overall direction of flow of the international wildlife trade goes from developing countries to developed countries. This trade is characterised by long supply chains involving a large number of intermediaries between the original collector of the wildlife and the final consumer. While many rural poor are involved as primary collectors, it is rare for a collector to be selling direct to an exporter. As described by Neumann and Hirsch

(2000), "the structure of relationships between collectors, middlemen, traders and wholesalers can be highly complex, involving various elements of exploitation, risk, co-operation, collusion and resistance...the character of these relationships can shift through time, from locale to locale and at different points along the marketing chain … lack of access to information, transport, credit and storage facilities combine to keep collectors at a great disadvantage in the market place. And these conditions provide plenty of opportunities for intermediaries to position themselves as almost unavoidable links in the marketing chain."

Shortening the supply chain is often seen as the easy answer to increasing income to collectors. But marketing collectives might be a better route, as intermediaries perform many vital functions, *e.g.* transport, packing and risk taking in the medicinal plant trade in Nepal. Removing intermediaries would expose collectors to the volatility of the industry.

Another approach to increasing incomes for the poor is the introduction of a private voluntary standard (PVS) into a wildlife trade supply chain that both facilitates trade and obtains decent returns for poorer industry participants. Examples include "fair trade" of non-timber forest products and recent proposals to produce sustainable exotic leather.

Such approaches have limited value when dealing with luxury goods. For example, consumers buy crocodilian leather produced from wild-sourced *Crocodylus porosus* from Papua New Guinea for its brand name, fashionable styling and longevity, but not for its inherent social or environmental value.

8.7.3. Combat over-exploitation and illegal wildlife trade

While most wildlife trade is legal and often economically useful, it has the potential to be very damaging. Some wildlife trade is conducted illegally, usually driven by a demand for rare, protected species, which need to be smuggled and/or a desire to avoid paying taxes and duties. Recent overexploitation of wildlife for trade has affected countless species. Besides raising concerns with regard to biodiversity, these forms of wildlife trade undermine developing countries' efforts to manage their natural resources for the long term benefit of the economy and society, as they hinder the ability of the public and particularly poor people to benefit from wildlife management.

East and Southeast Asia are among the regions in the world where parts of the wildlife trade are particularly damaging. The illegal trade in these regions in wild animals and plants (including fisheries and timber) is estimated to be worth many millions of dollars. In the early 1990s, the illegal wildlife trade in Vietnam was conservatively estimated at USD 24 million annually. In 2002, it was estimated at USD 66.5 million. In Thailand in 2003 a one day raid on Bangkok's Chatuchak market seized 1 000 protected species worth USD 1.25 million. In early 2004, Chinese law enforcement seized the skins of 31 tigers – today there are only 50 tigers estimated to be left in the wild in China – worth more than USD 1.2 million (World Bank, 2005a).

In the Mekong riparian states of Cambodia, Lao PDR, Myanmar, Thailand, Vietnam, and southern China, over-exploitation of wild plants and animals for trade (both legal and illegal) is considered to be the single greatest threat to many species, even more than habitat loss and degradation. Today, wildlife eradication happens even more quickly than deforestation.

Policies to address these harmful forms of wildlife trade should include *a)* a better understanding of the dynamics of the trade; *b)* regulatory controls at the national and

regional levels; *c*) incentives for better management of the species most under threat; *d*) improved awareness of the threats from the trade; and *e*) engagement of stakeholders at many levels and in different places.

Notes

1. A joint statement to the scientific body of the Convention on Biological Diversity (CBD SBSSTA) in 2004 noted that six of the biggest conservation organisations invest USD 500 million per annum in developing countries.
2. See *www.propoortourism.org.uk* for further details on the contribution of tourism to poverty reduction and to pro-poor growth.
3. The share of income from tourism which accrues to parties outside that particular destination (through, *e.g.* national taxes, payment for goods and services procured from outside the tourism area etc.) is called "leakage".
4. For an extensive discussion see Emerton (2001).
5. For a discussion of other arguments for and against trophy hunting, *e.g.* ethical and biological considerations, see also Lindsey *et al.* (2006).

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PART II

Chapter 9

Soil Productivity and Pro-Poor Growth

Soil productivity is essential to agricultural growth, food security and support of the livelihoods of the poor. This chapter highlights policies and measures to encourage improved soil management for pro-poor growth and improved food security.

9.1. Overview

This chapter and the next, on water security and pro-poor growth, are fundamentally different from the others in that they do not concern natural resources which can provide direct sources of income, but rather resources that underpin the production of a wide range of agricultural and industrial goods and services. The contribution of soil and water resources to pro-poor growth is indirect. It can only be derived from the importance of the many sectors that rely directly on soil and water productivity as inputs, in particular into agriculture.

Soil productivity is essential to agricultural growth, food security and support of the livelihoods of the poor. Agriculture is the major engine of economic growth in most developing countries (UNDP, 2007), providing incomes and revenues that enable investments in industrialisation and poverty reduction. Developing countries that are classified as low-income have the highest share of agriculture in GDP (typically, around 30%) and of rural labour in total employment (68%). That compares to 4% and 2% in high-income countries (OECD, 2007).

An analysis for the World Development Report 2008 (Ligon and Sadoulet, 2007) shows that a 1% increase in agricultural GDP leads to a 1.6% gain in the per capita income of the poorest fifth of the population. A 10% increase in crop yields leads to a reduction of 6% to 10% of people living on less than a dollar a day. Thus, if land degradation is allowed to continue, major opportunities for the reduction of poverty will be lost (GEF, 2006).

Besides its obvious importance for growth, the agricultural sector faces enormous challenges to meet the food needs of an additional 1.7 billion people over the next 20 years. Soil degradation through erosion, salinisation, and/or loss of minerals can threaten the agriculture sector's contribution to economic growth and to food security.

Assessments of the extent of soil degradation vary, but even based on conservative estimates it ranks among today's greatest environmental challenges, with serious local and global impacts. Soil degradation is reported to affect 30% of the world's irrigated lands, 40% of rained agricultural lands, and 70% of rangelands. This leads to an average annual rate of global productivity loss of 0.4% (World Bank, 2003).

About 2 000 million hectares of soil, equivalent to 15% of the Earth's land area, have been degraded through human activities (ODI, 2006b). Soil degradation appears to be particularly critical to populations in the developing world. The vulnerable soils and harsh climates in most developing countries exacerbate degradation problems. Productivity has declined on 16% of agricultural land in developing countries because of soil degradation. Almost 75% of Central America's agricultural land has been seriously degraded (ODI, 2006b).

The term "soil management" refers specifically to measures to sustain the productive capacity of land. Although this includes agricultural production techniques, this chapter focuses exclusively on measures to control soil erosion, prevent salinisation and pollution

and maintain soil fertility, as these directly affect soil productivity and its share in agriculture's contribution to growth.

Considering the enormous cost of soil degradation, investment in improving soil fertility is remarkably low, for a variety of reasons related to tenure, access to credit and markets, as well as fiscal and trade policies. Given the growing pressure on land in the developing world, the economic value of soil conservation is likely to increase.

9.2. The contribution of soil management to growth

9.2.1. *The costs of poor soil management*

Most of the literature on soils and macro-economic growth concentrates on the costs of inaction on soil degradation, rather than on the benefits of action (see next section). In Ghana, for example, it is estimated that soil erosion will cost around 5% of total agricultural GDP over the 10 years from 2006 to 2015 (Diao and Sarpong, 2007). Similar and even higher growth reductions are reported for other countries. Table 9.1 provides a summary of country studies that have estimated the extent to which soil degradation has caused a loss in agricultural incomes and the consequential reductions in economic growth.

Table 9.1. **Analysis of national annual costs of soil degradation in selected countries**

	Gross annual immediate loss (USD million)[1]	% of agricultural GDP[2]
Ethiopia	130	4
Ghana	166.4	5
India		5
Java		3
Madagascar	4.9-7.6	< 1
Malawi	6.6-19.0	3
Mali	2.9-11.6	< 1
Mexico		2.7
Pakistan		5
Zimbabwe	117	9

1. Annual costs of soil degradation arise from water and wind erosion, salinisation, waterlogging and/or fertility decline.
2. Percentages of agricultural GDP are based on World Bank figures for 1992, inflated by 3.9% per year to 1994.

Source: Scherr, 1999.

9.2.2. *The benefits of improved soil management*

The link between soil conservation and agricultural productivity serves as the basis for assessing the economic benefits of improved soil management. Although not the only essential input factor, soil does influence to a large extent crop yields and the production of animal fodder, *e.g.* grass.

Investing in soil management is important for poor people, since many of them live on marginal lands with poor quality soils and depend heavily on the quality of the land for survival. Evidence from China, Cambodia, Laos and Vietnam suggests that there is a strong overlap between degradable land and the places where the poor live (World Bank, 2005a).

Conserving soil depth and soil fertility can contribute to growth by sustaining the resource base for crop cultivation and livestock rearing. Soil management actions can address human activities such as overgrazing, overexploitation of plants, trampling of

soils, unsustainable irrigation techniques, or unsustainable fertiliser application that exacerbate soil degradation.

Pearce (2005) quotes an econometric study by Wiebe *et al.*, (2001) that shows that soil quality significantly affects the productivity of agricultural labour, with good soils and climate generating an average 13% increase in the output per worker, generating an increase in Africa of even 28%.

Efforts to mitigate the effects of soil degradation through improved soil management can be distinguished into *ex ante* soil conservation and *ex post* soil rehabilitation programmes. Soil conservation is a preventive intervention to limit the extent of soil degradation actually taking place. Soil rehabilitation compensates for previous degradation by restoring the useful capabilities of the soil resource. Obviously, soil rehabilitation is only feasible when degradation is reversible, and it may require extensive resources to restore severely degraded soils. The prevention of soil degradation is generally far more effective and efficient than its *ex post* rehabilitation.

Key preventive measures to protect soil from wind and water erosion include minimum tillage, crop residue mulching, organic matter application and maintenance of vegetative cover. Conservation Agriculture employs many of these approaches; in addition to its economic benefits, it contributes to maintaining or restoring soil biodiversity (Box 9.1). Structural approaches include stone lines, terracing, drainage channels, bund walls, windbreaks and tied ridging. These measures can also indirectly contribute to growth by preventing the silting up of waterways, dams and reservoirs, which can in turn substantially reduce water treatment costs and improve the quality of water.

Box 9.1. **Conservation agriculture**

Conservation agriculture (CA) is a concept for resource-saving agricultural crop production that strives to achieve acceptable profits together with high and sustained production levels. It concurrently conserves the environment and is based on enhancing natural biological processes above and below the ground. Interventions such as mechanical soil tillage are reduced to an absolute minimum, and external inputs such as agrochemicals and nutrients of mineral or organic origin are applied in a way and quantity that does not interfere with, or disrupt, the biological processes. It provides a sustainable production system, without sacrificing yields on high production levels.

Key advantages of CA include:

Labour saving: Soil tillage is of all farming operations the single element that consumes the most energy and labour. By not tilling the soil, farmers can save between 30% and 40% of time and labour. This is of particular importance for farmers who rely fully on family labour.

Erosion reduction: Soils under CA have very high water infiltration capacities, reducing surface runoff and thus soil erosion significantly. This improves the quality of surface water, reducing pollution from soil erosion, and enhances groundwater resources.

Yields: CA allows yields comparable with those of modern intensive agriculture but in a sustainable way. Yields tend to increase over the years with yield variations decreasing. In mechanised systems conservation farming reduces the costs of investment and maintenance of machinery in the long term.

Box 9.1. **Conservation agriculture** *(cont.)*

Carbon sequestration: Non-tilled fields act as a sink for CO_2 and conservation farming applied on a global scale could provide a major contribution to controlling global climate change.

Disadvantages in the short term are the high initial costs of specialised planting equipment and the completely new dynamics of a conservation farming system, requiring high management skills and a learning process by the farmer.

In Brazil the area under conservation farming is now growing exponentially having already reached 10 million hectares. The concept is also widely adopted in North America.

Source: FAO (n.d.), *Economic aspects of Conservation Agriculture*, *www.fao.org/ag/ca/5.html*, *accessed December 2007*.

The economic benefits of investing in soil management can be high. Economic rates of return of 30% have been shown in combined soil and water conservation projects in sub-Saharan Africa (Reij and Steeds, 2003). One of the world's largest soil management investments on China's loess plateau has improved the lives of over 1.2 million farmers (Box 9.2). This project, combined with other initiatives, halved the number of poor living below the poverty line from 59% in 1993 to 27% in 2001 (World Bank, 2003).

Box 9.2. **Investing in soil management in North China and in Niger**

The soils of Quzhou and Nanpi Counties in China were heavily salinated as a result of the poor drainage of irrigated water. Low-cost labour-intensive technologies were employed to reclaim the lands. Over 17 million cubic metres of soil were removed and 11 000 cubic metres levelled to prevent the pooling of stagnant water and improve drainage. The production of wheat, cotton and maize increased, with 23 000 hectares of land being reclaimed and a rise in the incomes of over 35 000 people living in the area as a result.

Source: IFAD (2001).

Between 1984 and 1999 the Keita Valley project in Niger rehabilitated 20 000 hectares of degraded land through a wide range of interventions. Trees were planted, sand dunes were fixed, stream banks were stabilised, dams and wells were built, farmers were trained, credit was extended etc. The pay-off may justify the cost (USD 65 million) over the long term because its results increased incomes in the area by an estimated USD 6 million annually.

Source: Winslow *et al.* (2004).

9.3. Policies and measures to encourage improved soil management

A complete discussion of the policies conducive to pro-poor agriculture is beyond the scope of this chapter, which focuses on the soil management dimension aspects of the issue. Readers are referred to the OECD publication *Promoting Pro-Poor Growth: Agriculture* (2007) for a complete coverage of the issues.

Key elements of a policy environment conducive to improved soil management are outlined below.

Pro-poor land tenure: When farmers and herders do not have long-term security over the land they use, the incentives for environmentally sustainable practices are lost. Defining a system of land rights should reflect suitable patterns of access and land use. The transition to individual land ownership also needs to be accompanied by a legal framework that secures entitlements to land. Security of tenure does not necessarily imply private property rights; collective and community-based soil management can also operate effectively. In successful communal systems, transparency and fairness in the allocation of resources to all stakeholders is essential.

Incentives and credit: Government incentives (*e.g.* in the form of subsidies for soil conservation) can overcome credit constraints that prevent the poor from making up-front investments in soil management with longer pay-back periods. Such schemes require careful design to avoid potential inefficiencies.

Training and knowledge: The poor have limited or no access to conservation technologies or fertilisers, preventing them from fighting soil erosion and fertility decline. Educating poor people in better techniques of farming, diversification and off-farm employment is also vital in land and soil management.

Market-based crop prices: In many developing countries, governments artificially reduce food prices, often in response to pressures from a relatively small, but influential, urban populations. This tends to reduce the profitability of agriculture, undermining incentives to invest in sound soil management.

Other elements that influence soil conservation efforts include investments in rural roads or improved rural infrastructure, as in general these increase market access and strengthen rural-urban links and improve access to credit and financial services. Promoting off-farm activities is important in reducing the dependence of rural people on agriculture alone.

Fertilisers are often used as a response to soil productivity declines and may be financially attractive if the government provides subsidies. However, mismanagement of fertiliser may discourage long-term investment in soil fertility and can lead to air and water pollution. Application of fertilisers should therefore be carefully managed, according to crop needs and soil characteristics. Fertiliser subsidies are often very expensive and their effectiveness in benefiting poor farmers is not always clear. Often the benefits of the subsidy are captured by monopolistic fertiliser importers or larger farmers.

Soil conservation may also require collective action by land-users in the case of clear externalities or open access issues. Institutions are needed to manage collective soil management activities. Local institutions may serve as forums to express local land-users' needs and can facilitate adoption of soil management techniques. Successful soil management programmes have often built on local knowledge and experience. They have also invested in people through training in new technical, organisational and management skills.

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PART II

Chapter 10

Water Security and Pro-Poor Growth

Water resources underlie the production of agricultural and industrial goods and services, and their careful development and management are essential to generate wealth, mitigate risks and alleviate poverty. This chapter outlines different mechanisms for effective water management and highlights some key lessons stemming from the experience of industrialised countries. Special attention is given to the politics of water management and institutional development.

10.1. Overview

In all industrial countries, the flows of almost all major rivers are regulated and managed, storing water for multiple uses, reducing peak flows, increasing low flows and protecting water quality, thus reducing the risk of water-related shocks and damage, increasing the reliability of water services for production and reducing other negative impacts, such as disease. Early and large investments have been made in bulk infrastructure and in the human capacity required to operate and maintain these investments. In most cases, the infrastructure platform is mature and the emphasis is placed on water management and infrastructure operations, both to maximise the returns on infrastructure investment and to respond to shifting societal priorities, where increasingly high values are placed on environmental and aesthetic assets. These investments in institutions and hydraulic infrastructure were clearly a pre-condition to *harnessing hydrology* for sustained and broad-based growth and development.

In intermediate economies which are still industrialising, much investment has typically taken place in water infrastructure. In some countries, substantial water investments are being made to promote growth (such as in hydropower and irrigation infrastructure), but the economy is still vulnerable to catastrophic impacts (such as those of floods and droughts). In yet other cases, financing has been available to build infrastructure, but institutional and human capacity is inadequate or has not sufficiently adapted to manage water resources and new infrastructure effectively. These varied circumstances underscore the imperative of balancing and sequencing investment in the institutions and infrastructure required effectively to manage water resources. While it is generally accepted that countries initially will place a premium on physical capital investments, human capacity and institutions can take much longer to build and adapt. The proper balance and sequencing of these investments will therefore be dynamic and highly context-specific. Getting this balance right will be crucial for leveraging and sustaining growth that may now be *hampered by hydrology*.

In least-developed economies, climate seasonality, variability and/or rainfall extremes are often marked, while the capacity, institutions and infrastructure needed to manage and mitigate these potentially major challenges are generally inadequate. Catastrophic hydrological events such as droughts and floods can have dramatic social and economic impacts with declines in annual GDP often exceeding 10% and tragic losses of life (Grey and Sadoff, 2006). What is less apparent is that, as a consequence of widespread expectations that these unmitigated catastrophes will recur, risk-averse behaviour and disincentives to investment become pervasive. Such behaviour can seriously undermine economy-wide investment and growth even in years of good rainfall. In many of the world's poorest countries, climate variability is high, water-related investments are relatively limited, and there is often a strong correlation between rainfall variability and GDP performance. Where economic performance is closely linked to rainfall and run-off, growth becomes *hostage to hydrology* (Box 10.1).

Box 10.1. **Hostages to hydrology**

Ethiopia

Hydrological variability seriously undermines growth and perpetuates poverty in Ethiopia. The economic cost of hydrological variability is estimated at over a third of the nation's average annual growth potential, and these diminished rates are compounded over time. Yet, with much greater hydrological variability than North America, Ethiopia has less than 1% of the artificial water storage capacity per capita to manage that variability. Economy-wide models that incorporate hydrological variability in Ethiopia show that projections of average annual GDP growth rates drop by as much as 38% as a consequence of this variability. In Ethiopia, economic growth is so sensitive to hydrological variability that even a single drought event within a 12-year period (the historical average is every three to five years) will diminish average growth rates across this period by 10%. The effects of hydrological variability emanate from the direct impacts of rainfall on the landscape, agricultural output, water-intensive industry and power production. Because Ethiopia lacks the water resources infrastructure and institutions to mitigate hydrological variability directly, and because it lacks the market infrastructure that could mitigate the economic impacts of variability by facilitating trade between affected (deficit) and unaffected (surplus) regions of the country, impacts are transmitted and even amplified through input, price and income effects on to the broader economy. The overall impact is that Ethiopia's economic growth is tied tightly to the rains.

Source: World Bank (2006c).

Kenya

In Kenya the costs of flood and drought are stark. The La Niña drought of 1998-2000, and the El Niño floods of 1997-98 each had devastating economy-wide and society-wide impacts, as illustrated in an analysis of the financial costs, from government accounts, of these events. The 1997-98 El Niño flood caused damage estimated at 11% of GDP (over three months). Over 90% of the calculated flood losses were associated with transport infrastructure damage (88%) and water supply and sanitation infrastructure damage (5%). The La Niña drought caused damage amounting to some 16% of GDP in each of the financial years 1998-99 and 1999-2000. It is interesting to note that the majority of these losses were associated with foregone hydropower (26%) and industrial production (58%). Agricultural losses associated with the drought accounted for 15% of drought damage, of which 10% were crop and 5% livestock losses. The remaining 6% of losses derived from adverse health impacts. The full economic costs in both cases are probably much greater, because these estimates did not include costs such as those from famine, hunger and malnutrition; losses of lives and rural livelihoods; and risk-averse behaviours, for example relocation of industries or farmers' reluctance to invest in farm inputs such as fertilisers and pesticides. In a recent investment climate study, Kenya is shown to have very low competitiveness, with indirect costs for a firm about three times that of a strong performer. The largest share of the indirect costs is transport (31%) and energy (19%) – which are those sectors most affected by flood and drought. During the period 1998-2000, it is understood that major investors withdrew from Kenya because of unacceptable costs and risks.

Source: World Bank (2004b).

There is a re-emerging consensus that water resources development and management are essential to generate wealth, mitigate risks, and alleviate poverty; that poverty demands that many developing countries will need to make large investments in

water infrastructure at all levels; and that this development must be undertaken building on the lessons of experience, with much greater attention to institutional development, to the environment and to a more equitable sharing of benefits and costs. The challenge of "responsible growth" is to grow, while at the same time embracing both environmental sustainability and social development.

10.2. The potential contribution of water resources management to pro-poor growth

Water resources development and management remain at the heart of the struggle for growth, sustainable development and poverty reduction. This has been the case in all industrial countries, most of which invested early and heavily in water infrastructure, institutions and management capacity. It remains the case in many developing countries today, where investments in water development and management are still an urgent priority.

Four different mechanisms can be described through which effective water development and management play a fundamental role in sustainable growth and poverty reduction.

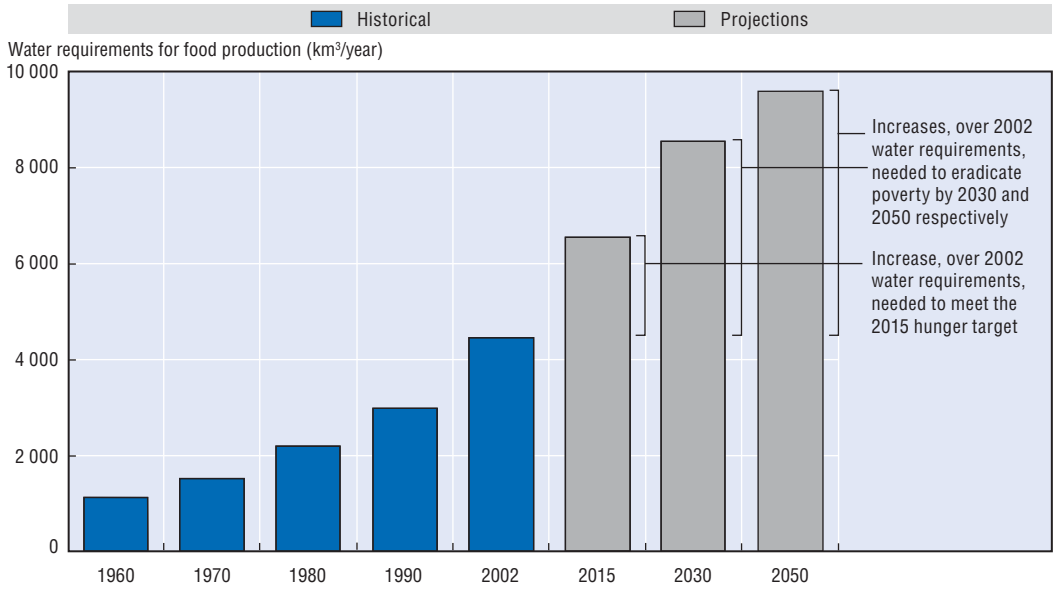
- Broad-based water resources interventions, usually including substantial infrastructure such as major canal systems, dams and inter-basin transfers, provide national, regional, and local benefits from which all people, including the poor, can gain.
- Poverty-targeted water resources interventions are of major importance, such as investments to improve catchment quality and provide livelihoods for the poor, because it is usually the poor who inhabit degraded landscapes.
- Broad-based water service interventions (such as those aimed at improving the performance of water utilities), user associations and irrigation departments benefit everyone, including the poor.
- Poverty-targeted water service interventions, such as water and sanitation and irrigation services for the poor who are not served, play a key role in reaching the MDGs. In most developing countries, growth-oriented, poverty-reducing water resources strategies will involve action in all four of these areas.

Water resources management encompasses water in all its uses, across all sectors. The economy-wide relationship of water with growth and poverty is the aggregate of the effects of water management policies and practices, as well as the contributions to growth of, and inter-relationships between, water use within individual sectors (such as water supply and sanitation, power, irrigated agriculture). It is clear that water use within individual sectors contributes significantly to this relationship, with each having its own welfare, growth, equity and gender implications. For example, decisions regarding whether water supply and sanitation services are to be provided, their location, cost and reliability, can all affect the spatial patterns and rates of growth that result from those investments. This will also be the case for investments in hydropower, navigation and industrial water services. In agriculture, the balance between traditional subsistence agriculture (which generally targets the very poor and provides greater employment opportunities) and highly intensive production (which generates higher value added to a smaller immediate beneficiary group) will significantly affect the market value of agricultural production and the distribution of these gains.

10.2.1. Water for irrigation and growth

For the 2.5 billion people living in low-income countries, agriculture is the most important sector by employment, and by far the largest user of water (World Bank, 2007). Any poverty reduction strategy must therefore take into consideration factors related to food production, coupled with effective water resources management. Irrigated land currently produces 40% of the world's food on 17% of the world's agricultural land (World Bank, 2004c). More effective water management while possibly expanding the irrigated area can have benefits in terms of increased production of (export) crops.

Figure 10.1. **Trends in water requirements for food production**



Source: WRI (2006).

Water used for irrigation agriculture can be a powerful means of reducing food costs among the poor. However, irrigation impact studies focusing only on the benefits at farm level underestimate the overall livelihood impacts of irrigation development. Backward and forward linkages of irrigation in other economic activities may be substantial, as irrigated agriculture can support economic development in rural areas. This may stimulate employment and development of supporting agro-food industries and other off-farm activities (Box 10.2).

Ensure that the poor are allowed access to irrigation water. Access to irrigation water, like land, is heavily biased in favour of wealthy farmers. Specific measures are therefore necessary to ensure that the poor benefit from improved access to water. In many parts of the world, such as Sri Lanka's major irrigation resettlement programmes, women lack land rights to irrigated land, and hence are more likely to face poverty. Water technologies do not have to be large-scale. Interventions of providing access to small-scale water technology to poor farmers can have huge economic benefits. The direct total net benefits of promoting these technologies has been estimated at between USD 100 billion and USD 200 billion for the estimated 100 million farmers who could adopt these tools. When including indirect benefits in the economy, using a multiplier of three, total benefits can increase to USD 300 billion and USD 600 billion (SIWI, 2005a).

Box 10.2. **Irrigation water and economic growth in India: Successful investments in water resource management help India cope with climate variability**

In India, irrigation has been one of the critical components in agricultural growth, rural economic development and the poverty reduction process.

Initial investments in India in water resources management and multi-purpose hydraulic infrastructure had massive regional impacts with large multiplier effects on the economy. It has been suggested that, over the long run, irrigation benefits far transcend the command areas of irrigation systems. The incremental impact of irrigation and other factor inputs on agricultural productivity growth and poverty reduction has been shown to be large. In some areas, more than two thirds of the benefits from irrigation have been captured by the non-farm sector. A case study on macro-level impact analysis in India analyses the incremental impact of irrigation and other factor inputs on agricultural productivity growth and development of agriculture, and in turn their implications for poverty reduction in India. Bhattarai and Narayanamoorthy (2002) found an irrigation elasticity of poverty of 0.27 as a direct impact, and an irrigation elasticity of rural per capita consumption of 0.18 in India. There are also direct correlations between investments in irrigation and significant declines in poverty: irrigated districts average 25% poverty rates against 70% poverty rates in non-irrigated districts. This is also due to the creation of employment and other non-farm sectors' inter-linkage effects.

A combination of infrastructure investment in water management and economic diversification has helped de-link the economy from the monsoon. An Indian finance minister said that in the 1980s "every one of my budgets was largely a gamble on rain". A recent newspaper editorial headline in India said: "Growth surge: no longer a gamble on Monsoon", describing the shift out of agriculture and the expansion of manufacturing, communications and transport which is making the structure of the economy less vulnerable. Still, the variability of rainfall in recent years continues to take a heavy toll across many regions of India, and the 2005 monsoon claimed about 400 lives and caused USD 700 million in damage in Mumbai.

Source: Bhattarai and Narayanamoorthy (2003) and Grey and Sadoff (2006).

10.2.2. Water for hydropower and growth

Hydropower also contributes to economic growth. The 2002 Earth Summit in Johannesburg identified hydropower as one of the major sources of renewable energy. Currently, hydropower provides about 19% of the world's electricity supply, but there are still a limited number of hydropower plants in most developing countries. Hydro-electricity is the key power source of the 26 sub-Saharan countries, and for a further 13 other developing countries it is the second main power source. Hydropower developments can contribute to economic growth through the stimulation of capacity development, increasing the electricity supply of the nation, the related benefits accrued to the economy and through the revenues created through electricity exports. In Bhutan, over 45% of government revenue comes from hydropower exports to India (IMF, 2004). Bhutan's king, His Royal Majesty King Wangchuck, has stated that, "Water is to Bhutan what oil is to the Arabs" (The Hindu Business Line, 15 August 2006, *www.thehindubusinessline.com/2006/08/15/stories/2006081500941000.htm*). In Asia, Laos and Nepal are also seeking to develop their rich water resources, while in Africa Lesotho is developing its hydro exports.

Special measures are needed to ensure that the poor do not suffer the social and environmental costs of large-scale water infrastructure. Dams can displace many existing residents or disrupt their livelihoods. While these kinds of investments are often key in economic and national development, there are also many instances where those displaced – most often the poor – have lost their homes and livelihoods and have not received adequate compensation. There are also several instances where upstream dams have disrupted the downstream livelihoods of poor communities depending on fisheries. This is now a major concern in the Upper Mekong River, which supports a rich fishery downstream.

10.2.3. Water supply and sanitation and growth

Improved water supply and sanitation have also been shown to contribute to growth. This has been measured in several ways.

- *Faster growth in countries with better water access*. The GDP of low-income countries with improved access to safe water and sanitation grew on average at 3.7% per year, whereas the GDP of countries with limited access grew at only 0.1% per year (WHO, 2001).
- *Saving in time*. The largest potential gain of investments in improved water management is found in convenience time saving. Water collection and sanitation access time saved due to improved access has been found to amount to USD 64 billion (SIWI, 2005b).
- *Reduced cost of disease and death*. Meeting the MDG target on water and sanitation could save the health sector annually USD 7 billion. There can be an additional saving of USD 340 million from treatment costs. People can benefit from fewer days lost to illness. Meeting the MDG target on water supply and sanitation has also been estimated to gain 322 million working days per year, and the annual global value of adult working days that could be gained as a result of less illness has been found to amount to USD 750 million. Finally, using techniques to value lost life years, Sachs (2001) estimates that policies aimed at reducing water-related diseases could save 330 million disability adjusted life years (DALYs) by the year 2015. Valuing a DALY at USD 563 at low-income countries revenues, a single year's benefits could amount to USD 186 billion (SIWI, 2005b).

From these figures, it is clear that the economic benefits of improved water supply far outweigh the investment costs. Returns range from USD 3 to USD 34 for every dollar invested, depending on region and technologies employed (SIWI, 2005b).

However, the poor are least well served by public supply and sanitation. This issue, and its policy implications, is addressed in detail in a number of recent publications. Readers are referred to, for example, *Water Governance for Poverty Reduction Key Issues and the UNDP Response to Millennium Development Goals* (UNDP, 2004).

10.3. Ensuring responsible water management

Responsible management of water resources is widely accepted as an imperative not only for sustaining the range of economic services provided by water (irrigation, energy production etc.) but also an imperative for sustaining the livelihoods and well-being of the poorest populations, who are most vulnerable to their deterioration.

In addition, it is increasingly recognised that conserving and enhancing "natural infrastructure" (*i.e.* aquifers, watersheds, lakes and wetlands) is a sound investment, complementing and in some cases substituting for artificial storage, regulation and water

Box 10.3. **Valuing the Zambezi's wetlands as an infrastructure alternative**

Restoring wetlands can increase storage by recharging groundwater, regulating stream flows (thus mitigating floods and drought), reversing changes in the microclimate, and protecting and improving water quality through purification and treatment. However, valuing the associated contribution of wetland biodiversity and critical habitat benefits is often difficult, especially when based on non-use values. A rough assessment by the World Conservation Union (IUCN) on the economic value of wetlands in the Zambezi basin in Southern Africa suggested that there was a net present value of USD 3 million in reducing flood-related damage, USD 16 million in terms of groundwater recharge, and an estimated USD 45 million in water purification and treatment services.

Source: Emerton and Bos (2004).

treatment infrastructure and services, serving the needs of water-using sectors as well as ecosystems (Box 10.3).

This implies recognising that water use can create various kinds of environmental problems which have to be taken into account in water resources management:

- *Over-abstraction of water* (*e.g.* Aral Sea) can create conflicts and tensions among competing users in water-scarce regions. Unsustainable pumping of groundwater (Box 10.4) is a major threat to food security, as 10% of the world's agricultural food production depends on mined groundwater (FAO, 2003).

Box 10.4. **Pakistan and water problems**

Pakistan is predicted to be one of the seven countries most likely to face a serious water shortage by the year 2025. The agriculture sector faces major environmental challenges, including water scarcity in some areas, and waterlogging and salinity in others. In addition, nearly 38% of the Gross Commanded Area (GCA) is waterlogged, of which 15% is severely waterlogged. Of the surface 14% is saline, of which 6% is severely saline. Salinity is estimated to rob farmers of about 25% of the potential production of major crops.

Owing to age, overuse and poor maintenance, the efficiency of delivery of the canal system is low. Moreover, inefficient water delivery and use also mean that, in reality, surface water does not reach many users toward the tail-end of the system. Inequity in the distribution of surface water, as a result of deliveries of less than designed levels, poor operation and maintenance, as well as illegal diversion are major concerns in Pakistan, and most negatively affect the poorest farmers.

Excessive groundwater abstraction, encouraged by electricity subsidies which create incentives for pumping, is another concern. While the situation in each province is different, the impacts are particularly serious for Baluchistan, which has only deep groundwater and almost no surface water. A decline in water tables has reduced access to water for the poor. The most glaring example of this in undermining Baluchistan's collective groundwater is the effect of private tube wells known as *karezes* (a mother well with a string of wells connected by tunnels which will serve over a hundred households which shared the already high costs of installation and maintenance).

Source: Bhatti (1999).

- Over half of the people of India, Pakistan and Bangladesh have, for instance, a livelihood stake in *groundwater irrigation* (Shah, 2004).
- *Pollution* from industry, agriculture and household waste disposal can lead to deteriorating water quality, with serious public health problems in poor communities which do not have access to safe drinking water sources.
- Soil *erosion* through water run-off, coupled with the loss of land along rivers and coasts, can reduce the amount of fertile arable land, and therefore the viability of agriculture, on which many poor people depend. Soil erosion and water run-off also lead to deterioration in roads and waterways as well as coastal fisheries.
- Surface and sub-surface *salinisation*, including saline intrusion into freshwater aquifers threatens agricultural productivity (*e.g.* in Gujarat in India, Java in Indonesia, and Saudi Arabia).

10.4. The politics of water management to promote pro-poor growth

It is also important to understand the impacts of water use across sectors. Water policies and reforms and infrastructure investments in one sector rather than another will have very different consequences for growth and poverty alleviation. For example, irrigation and household water supply and sanitation services have traditionally been seen as pro-poor, whereas investing in hydropower and industrial water supply has traditionally been seen as a strategy for economic diversification and growth.

Clearly these are very broad generalisations, but inter-sectoral water resource allocations will affect the structure of economies, patterns of development and growth (with associated equity and gender implications), and the environment. The allocation of water between the agriculture, power, industry and services sectors will enable or constrain their relative growth, and give rise to very different economies over the medium term, with differing welfare impacts both in terms of overall growth and the distribution of this growing wealth. Moreover, it is quite often the case that the allocation of water and water investments between sectors is the result of political economy rather than deliberate development policy, allowing the "capture" of water resources by powerful interests in ways that hinder opportunities for more effective resource management.

Realising the potential of water as a fundamental resource in a country's economy requires significant efforts, including harnessing the water resource, putting efficient and equitable allocation mechanisms into place, building structures, motivating good performance of water utilities and irrigation districts, and providing for effective drought and flood management. All these actions are interconnected. They require investment in new technologies, infrastructure, management capacity, institutional development and systems of water prices. Furthermore, all these actions and investments have to be coherent with a long-term vision for the sustainability of the resource.

Water is a natural resource that will typically serve the greater benefit of society as a whole, and thus has many possible values. Such impacts explain why governments sometimes subsidise those uses of water that have a high social value, but produce little income. Social concerns may require subsidies, but it is critical that there be transparency. It is therefore a challenge to identify the right balance between water treated as an economic good and water treated as a social good – a balance that is generally only achieved through political processes.

To address the water-related challenges discussed, incentives for reform need to be created. Key incentives originate from the potential for corruption, the degree of transparency in decision making processes and the involvement of stakeholders, creating a system of water rights, establishing a system of water prices and involving external institutions in large-scale developments.

Perverse incentives for corruption. There is often corruption in the provision of water infrastructure and water flows and this inevitably affects the poor, who have the least ability to pay and exert political pressure as compared with the non-poor. Corruption is also a major factor in water resources development. While the construction of dams and large irrigation schemes is motivated by many factors, one factor often overlooked is that improving the efficiency of existing water provision offers much less potential for kick-backs and corruption than awarding contracts for constructing new large scale water infrastructure. Large engineering firms aggressively pursue these contracts, and both they and the government which awards the contract may engage in bribery in the award of the contract. This type of situation can be overcome through transparency in procurement decisions and by ensuring proper assessment of the relative economic cases for new water construction *versus* improving the efficiency of existing infrastructure.

Address politics of unequal access to water services. Social factors such as gender, caste and ethnic discrimination may be key factors that explain reduced access to services in some areas. In India, for example, caste may be a key factor in determining water access. In South Africa the legacy of apartheid has meant that few black families had access to water (Box 10.5).

Box 10.5. **South Africa's water laws and their implementation**

One country that has pioneered a rights-based approach to natural resources is South Africa. In the field of water governance, two new laws were passed. These had to address the lack of water access and inequities in water distribution. In the Mhlatuze basin in Kwa-zulu Natal, more than 97% of resources are allocated to 10% of the population. The Water Services Act provides for access to safe drinking water and sanitation. Uniquely in the world, "free basic water" is provided to a radius of within 200 metres of the household area.

Since 1994, the Department for Water Affairs and Forestry has provided basic water supply to 9 million people. In 2002 alone, 1.2 million people received water supply infrastructure, while 50 000 people received household sanitation. In the process, temporary employment for 25 000 person was created. Over 57% of the population are receiving free basic water. The National Water Act will establish catchment management agencies (CMA) in each of South Africa's 19 water management areas, and these will have functions devolved from the centre. Five CMAs have been gazetted or soon are to be.

Source: www.iwmi.cgiar.org/Research_Impacts/Research_Themes/BasinWaterManagement/Water/Outputs.aspx – 21k.

In many countries women lack rights to land, a factor which reduces the benefits accruing to them from irrigation. Similarly, in many urban areas, poor people lack tenure, reducing their access to water (Box 10.6).

Box 10.6. **Importance of urban tenure for water supply: The example of Guatemala**

Tenure is closely linked to relative improvements in the standard of living for the 25 000 people in the squatter settlement of La Verbana in Guatemala. The settlement received land rights in the 1960s following protests led by a committee for improvement. The result has been access to water, sewerage, drains, and street lighting.

A representative from the local housing department noted: "*I am convinced that the issue of legalisation is the first step in improving housing and working towards overall improvement of the community. Just allowing the people to become owners of the land gives them security of tenure and the guarantee of having something that they can give to their kids.*" In the 1970s some of the community were able to access a water supply. However, with the expansion of the settlement, many remained without service and in 1994, an agreement was negotiated with the municipal water company for each family to pay for a connection and contribute material for pipes.

Source: Grant (2001).

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PART II

Chapter 11

Minerals and Pro-Poor Growth

Access to minerals is essential to modern economies. As a result, in many developing countries the flow of foreign direct investments to the minerals sector by far exceeds aid flows. This chapter highlights strategies that can help poor countries harness their mineral wealth as a source of pro-poor growth. It demonstrates how good governance, strong institutions, effective regulatory frameworks and rigorous environmental and social safeguards can help ensure that the presence of mineral wealth represents a "blessing" rather than a "resource curse".

11.1. Overview

Rising demand for mineral resources from fast-growing markets in Asia has contributed to a surge in mineral prices over the past five years. This is particularly true of metals such as aluminium, nickel, copper and zinc. The boom in mineral commodity prices has highlighted the impact of mineral exploitation on development processes. Yet mineral markets are volatile and the contribution of mining activities to positive long-term development outcomes, such as the attainment of the MDGs and sustainable development, during this period of opportunity has never been under closer scrutiny.

Driven by the prospect of higher revenues, developing countries are increasingly turning to their minerals wealth as a source of growth and new economic development opportunities. However, they are also increasingly aware of the adverse impacts that these resource endowments may have, if not prudently managed during their exploitation.

The extractive industry sector is very diverse. Classification may refer to scale of operation, nature of activity (underground, off-shore, open-cast, etc.), material extracted (industrial minerals, gemstones, precious metals, oil and gas etc), utility (energy, metallic and non-metallic, *e.g.* industrial minerals and precious stones) or degree of capitalisation.

However, the unifying feature of all extractive operations is that the resource being extracted, on human time-scales at least, is non-renewable. The goal of non-renewable resource exploitation, in terms of sustainability, is not extraction *per se*, but the conversion of natural capital into other forms of capital (human, financial, and manufactured) and more sustainable livelihood opportunities. Mineral prices are volatile. They have risen significantly in the past five years, creating renewed interest in many developing countries from large-scale operators but also a boom in the "artisanal" (small-scale, independent, self-employed and/or subsistence) sector. Between 2000 and 2005 the value of world trade in minerals grew by 17% annually (WTO, 2006).

In terms of scale, three general levels of extractive operation are suggested: large, medium and small/artisanal.

- **Large-scale:** dominated by a small number of capital-intensive, multi-national or parastatal operations. These use extraction and processing technologies that require high levels of investment and skills. Significant revenues, economies of scale and efficiencies result from these operations.
- **Medium-scale:** includes state-run enterprises, such as national oil and gas producers and numerous "expansionary juniors" (with less than USD 100 million assets) in the hard rock mining sector.
- **Artisanal and small-scale mining (ASM):** represents the historical foundations of all mining and includes a range of low-cost operations from individuals using rudimentary technology through to typical SME operations with minimal capital investment, high labour intensity and low levels of technology for extraction and processing. This scale of operation is characterised by inefficient recovery rates and technologies that limit the

resource that can be accessed. This dimension is almost exclusively limited to hard rock mining and represents the majority of people engaged in the sector in many developing countries, most of whom are abjectly poor. It is estimated that ASM produces up to 31% of the global production of minerals including 20% to 30% of gold, 20% of coal, 10% of diamonds and 75% of non-diamond gemstones. (See CASM, 2007).

This chapter focuses primarily on the hard rock mining sector.

11.2. The economics of mining

Mining can contribute to economic development in several ways: foreign direct investment (FDI), employment, government revenues, foreign exchange earnings, innovation and development of related sectors.

Minerals represent only a small part of world production and trade and global FDI flows. However, their supply is essential to modern economies and minerals exploitation represents the major part of FDI flows in many developing countries, often dwarfing aid flows.

11.2.1. *The contribution of mining to growth, exports and fiscal revenues*

Accurate statistics of the economic benefits derived from mining are difficult to obtain, especially when the full scale range of the sector is considered. For example, the informal and frequently illegal nature of ASM activities results in significant losses of potential government revenues. Where figures are available and reliable they indicate an important contribution by mining to the GDP of many of the poorest countries, including Botswana (38%), Guinea (17-20%), the Democratic Republic of Congo (10%), Zambia (10%), Ghana and Bolivia (5%). (USGS, 2005). Ore and metal exports constitute a large part of total exports for several countries, in particular for countries in West and South Africa and in South America (see Table 11.1). In Tanzania, mining represents 40 % of national exports, 75% of foreign direct investments and is estimated to have contributed about 6 % of the total annual GDP growth rate of 4.8 % between 1996 and 2003 (ICMM / World Bank, UNCTAD, 2006a).

Many governments derive a large part of fiscal revenues from the mining sector. In Botswana more than half of fiscal revenues are derived from mining (USGS, 2005) whereas mining accounts for 43% of government revenues in Peru (gold, copper, zinc, etc.) (UNCTAD, 2007), and 22% of fiscal revenues in Chile (copper) (ECLAC, 2007).

11.2.2. *The contribution of mining to employment and subsistence*

The ILO has estimated that the mining sector employs 22 to 25 million people worldwide, approximately 1% of the total global workforce (ILO, 2007). Large-scale mining is an increasingly efficient and capital-intensive activity requiring increasingly higher skills levels.

The nature and dynamics of the artisanal sector, often illegal and always informal, make precise numbers extremely difficult to estimate. This is coupled with the fact that mining may be pursued during periods of agricultural inactivity or other underemployment.

The sector often operates in poor, remote locations that create opportunities for the sector to provide pro-poor benefits that other private sectors, government or donor initiatives are unable to provide. Figure 16 shows how ASM mining is spread across the globe.

ILO estimates of 11.5 to 13 million people being directly engaged in ASM are known to be extremely conservative (ILO, 2007). Driven by rising metal prices, the ASM sector is a growing phenomenon. In Zimbabwe, for example, small-scale mining activities are likely

Table 11.1. **Developing and transition economies with higher dependency on exports of minerals: Mining's contribution to total exports**

Economy	Ores and metals	Product description
Guinea[2, 3]	89.8	Bauxite, alumina, gold and diamonds
Botswana[4]	87.2	Diamonds, copper, nickel
Suriname[2]	70.0	Alumina (aluminium oxide)
Zambia	61.5	Copper, cobalt
Jamaica	60.8	Alumina, bauxite
Niger[2]	46.1	Uranium and gold
Chile	45.0	Copper
Mozambique[2]	42.3	Aluminium
Papua New Guinea[2]	38.6	Gold, copper
Congo Republic[5]	34.0	Various metals
Ghana	33.3	Gold
Cuba	33.2	Nickel
Peru	32.9	Gold, copper, zinc
Rwanda[2, 6]	32.2	Various metals
Uzbekistan	30.3	Gold
Georgia	24.9	Various metals
South Africa[3]	21.7	Platinum, gold
Bolivia	19.1	Zinc, gold
Kazakhstan	18.0	Various metals
Bahrain	16.8	Aluminium

1. Fuels include SITC 3. Ores and metals include SITC 27+28+68 and, when relevant, diamond ore has been added.
2. Two to four years average.
3. The Economist Intelligence Unit.
4. Bank of Botswana, Financial Statistics.
5. IMF, Direction of Trade and Statistics.
6. IMF, Direction of Trade Statistics.

Source: UNCTAD (2007), calculation based on COMTRADE database and other sources.

to triple within the decade from 2000 to 2010; the situation in other parts of the region should largely follow a similar pattern (Drechsler, 2001).

In individual countries the ASM sector often exceeds numbers in formal mining. At least 5 million of the global total of the ASM sector are thought to be women and over 1 million children (ILO, 2007). Those involved in artisanal and small-scale mining are typically highly vulnerable. Legal protection is often minimal and the risks for expulsion and human rights violations high. In addition, safety, health and environment considerations are frequently non-existent and social dysfunction rife in ASM communities.

11.3. Environmental impacts of mining

In comparison with agriculture or commercial forestry, mining is not generally an extensive form of land use. Widespread impacts can occur as a result of catastrophic pollution of water bodies, etc., but the footprint of mining can usually be managed to limited spatial coverage.

However, where it occurs, it can have significant and irreversible impacts. Storage of tailings and waste may be a more damaging activity than the mining operation itself.

The negative environmental impacts of mining include energy and water consumption; air, water and land pollution; subsidence; landscape alteration, etc. Impacts

from artisanal and small-scale mining in particular include the silting up of rivers, exploitation of bush meat, deforestation, and mercury and cyanide pollution.

The consequences of polluted water, land and soils can be seen in terms of bad health, lost agricultural productivity and damaged ecosystems. There is also the issue of inherent clashes of interest between miners and other residents, such as between mining companies and indigenous peoples over cultural or local resources.

Negative environmental impacts can be managed through better planning, including the use of environmental impact assessments, environmental management systems, mine management plans and post-closure, or simultaneous, rehabilitation and closure plans. These are increasingly negotiated into start-up contracts and include payments into legacy funds during operation when revenues are being received.

11.4. What is the potential for mining to lift the poor out of poverty?

The track record of countries with the opportunity to convert resource abundance into broader development goals is often disappointing. Resource abundance often does not translate into economic prosperity.

A recurring hypothesis in the evaluation of the role of mining in development processes has been whether the occurrence of mineral wealth represents a "blessing" or a "resource curse". Opinions are divided on whether developing countries suffer or benefit from their mineral wealth (ICMM/World Bank/UNCTAD, 2006b). Intuitively it might be expected that mineral wealth and its prudent exploitation would form the basis for economic growth, poverty reduction and sustainable development. Paradoxically, however, some resource rich countries remain amongst the poorest and have the highest levels of poverty, corruption and conflict.

Amongst the world's most mineral dependent states, 11 are heavily indebted and five have had recent civil wars. For an example see post conflict Sierra Leone (Box 11.1).

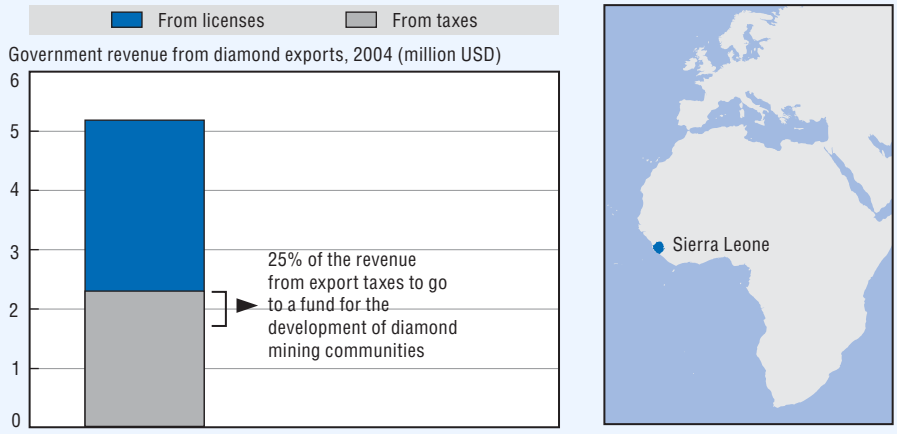
If access to high-value mineral resources can be controlled by factions and elitist groups, the opportunities for conflict and corruption escalate. Once the mineral resources are captured, government and politics are also captured, and the resources can form the basis of political patronage and the benefits for pro-poor growth are few (Archibald *et al.*, 2007). Rent-seeking and corruption tend to be widespread, and in the worst cases the appropriative struggle turns into a full-scale civil war (*e.g.* Sierra Leone's civil wars included the conflict over control of the diamond fields).

The mining sector may be simultaneously an opportunity and a threat to the development prospects of poorer countries. It has been shown that the "curse" is not inevitable, it can be addressed through good governance (Mehlum and Torvik, 2006).

When benefits flow to the poor, the mining industry can provide a route out of poverty. Indeed, mining was an important driver of growth in the USA, Canada and Australia in the early 20th century. More recently, Chile and Botswana have been examples where mineral wealth exploitation has powered successful development. The challenge is to recognise the potential for the resource curse and work to counter it.

The economic trickle-down effects from mining as a stimulant to other economic activities are not as widespread as they could be and there is still great potential for improvement.

Box 11.1. **Diamond mining in Sierra Leone**



In 2004, the government of Sierra Leone saw a total of USD 5.2 million in revenues from diamond related activities. This came in the form of mining, dealer and export licence fees and from export taxes. To feed some of the revenues back to poor communities, the Diamond Areas Community Development Fund (DACDF) was set up, with an annual commitment of 25% of revenue from export taxes. The intention is that this money will be dedicated to community infrastructure, agricultural improvements and training, but the actual distribution of the funds has been problematic. (Diamonds and Human Security Project, 2006. *Diamond Industry Annual Review* – Sierra Leone 2006).

Source: Diamonds and Human Security Project (2006).

According to the Fraser Institute's Annual Survey of Mining Companies (2005-06), the countries with the lowest scores for the overall policy attractiveness for mining exploration and investment were all countries with significant mineral wealth.

Good governance, strong institutions, effective regulatory frameworks, rigorous environmental and social safeguards and the protection of rights including rights from customary tenure are needed to realise the economic potential for pro-poor growth and ensure more equitable distribution of benefits. Lost opportunities arising from poor governance are illustrated by the example from the Democratic Republic of Congo (Box 11.2).

Mineral wealth exploitation is usually governed in developing countries by mining codes. The evolution of "mining codes" has been described as having three phases. The first has been characterised by major withdrawal of state intervention. It has been argued that this went too far in reducing the role of the state in favour of attracting foreign direct investments and resulted in driving down standards in areas of social and economic development. The second places greater emphasis on the responsibilities of companies for socio-economic development. In Mali, for example companies are required to pay a tax directly to regional governments for re-allocation to local communities. The third places greater emphasis on the participation of affected people and enhanced government responsibility for environmental and social safeguards. The Democratic Republic of Congo (DRC), for example, has made provision to ensure revenue distribution favours those directly impacted by mining companies (60% of royalties remain with the central

Box 11.2. **Artisanal mining in the Democratic Republic of the Congo (DRC)**

The DRC contains some of the richest and most diverse minerals in the world including gold, silver, tin, copper, coltan, cobalt, zinc and uranium.

Artisanal mining is responsible for 80% of the DRC's mining activity. It is a sector that has been associated with corruption, conflict, human rights abuses, environmental degradation, hazardous working conditions for miners (including women and children), regional instability, etc.

In 2004, revenues from mining were calculated at USD 15 million. It has been estimated, however, that the state lost revenues 10 times this amount, money that could have been invested in health care, education, etc. The value of illegal exports of gold, copper, cobalt and diamonds is estimated by the United Nations to be about USD 3 billion per year.

Of the population of the DRC 80% exist on less than a dollar a day. The exploitation of minerals could clearly be a key driver of growth and poverty reduction in the DRC through the generation of fiscal revenues for pro-poor programmes.

Source: Unpublished briefing paper for CASM workshop, Kinshasa *(2007)*: "ASM in DRC – key issues, challenges and approaches", CASM, *www.casm.site.org*.

government, 25% go to the provinces and 15% to the community where the mining occurs (CASM, 2007).

Although a unique example in many ways, Botswana provides a striking example of a developing country using its mineral wealth (diamonds) for poverty reduction. It has evolved from being one of the poorest countries in the world to a middle-income country. This success has been widely attributed to sound economic policies, especially in managing its large diamond resources, and a commitment to fiscal stability (Box 11.3).

Box 11.3. **Diamond mining in Botswana**

On independence in 1966, Botswana was a country of 1 million people and an economy dependent on the cattle industry. It was dominated by the institutions and customs of the main Batswana tribe: the BamaNgwato.

The first government after independence made two decisions that would later prove to be crucial to growth and development. A Mines and Minerals Act gave all mineral rights to the state rather than to the tribal authorities. Foreign firms were invited to explore for minerals. It soon became apparent that the country was richly endowed with, amongst other assets, kimberlitic diamond deposits. The second crucial decision was a renegotiation of the deal with the mining firm DeBeers in 1975. This allocated the state half of all profits of diamond revenues.

Government revenues, primarily from diamond exports, were channelled into investments in education, health-care, and infrastructure while maintaining tight fiscal control. A contributing factor has been the creation of a set of rules, a Sustainability Budget Index, to avoid fiscal deficits by keeping track of the ratio between consumption expenditures and non-mineral revenues. Natural resources revenues are used for investments rather than consumption as long as the ratio remains less than one. Botswana experienced almost three decades of high growth rates. By the late 1990s, the country rose to the status of a middle-income country.

Source: Acemoglu *et al.* (2003).

11.5. The politics of increasing the role of mining to promote pro-poor growth

Good governance is critical if the benefits from mining are to reach the poor and contribute to sustainable growth. Recent debates have emerged on ensuring greater development outcomes from mineral extraction. Five issues are central: fairer contracts; increasing revenue transparency; pro-poor benefits sharing; beneficiation (adding value prior to export); and corporate social responsibility.

11.5.1. *Improving the contractual framework*

Contracts will determine the legal rights and terms under which companies exploit mineral wealth and the benefits host countries and their citizens get in return. Well managed mineral institutions and a good geological database and inventory of mineral resources enhance the government's chances of entering into equitable deals.

The differences between different types of contracts are generally over how the risks and rewards are to be shared between company and host government. The negotiations over the terms of these contracts are therefore critical in achieving pro-poor outcomes from mining ventures.

Host governments are keen to increase their share of benefits not only from revenues but also from transfer of technology. Concerns are expressed that large companies have a disproportionate amount of power in negotiation contracts – financial resources, legal and negotiating expertise, political influence, and lobbying tactics.

Contracts which have been negotiated during periods of weak governance (*e.g.* in post conflict situations) are being increasingly questioned (Democratic Republic of Congo), and in several countries new governments have put significant pressure to renegotiate contracts for better conditions or greater national control over assets (Russia, Venezuela, Chad, Peru and Bolivia). The long term success of such changes partly depends on the governments' ability to attract sufficient investments in the sector.

11.5.2. *Increasing revenue transparency*

A transparent and enforceable set of mining contracts (within the bounds of commercial confidentiality), together with transparency over revenue payments and receipts, will enable a country's civil society to hold its government to account for the way in which national mineral assets are being developed and spent. The Extractive Industries Transparency Initiative is an example where the private sector, governments and civil society are working together to increase transparency (Box 11.4).

11.5.3. *Pro-poor benefits sharing*

A current issue of debate is whether a national government should give preferential treatment to mining communities in the allocation of the mining revenues it receives. Policies and programmes can also be tailored to support small-scale and artisanal miners. Some programmes seek to empower artisanal miners by protecting their rights, providing better access to markets, or transferring knowledge in order to increase the share of benefits that stays with the poor. Programmes often set out to create awareness of the health and environmental impacts of artisanal mining operations.

Conflicts between large-scale and small-scale/artisanal miners are growing, especially, but not exclusively, in areas where commercial mining concessions and activities restrict (or displace) the activities of artisanal miners. This is an issue addressed

by De Beers in partnership with the government of Tanzania through the Mwadui Community Diamond Partnership, a pilot project aimed at giving miners a fair share of diamond-mining revenues and investigating alternative sustainable livelihoods, thereby alleviating poverty and accelerating pro-poor growth in communities around the Williamson diamond mine (UNGC, 2007).

11.5.4. *Adding value prior to exports: Beneficiation*

Beneficiation involves refining an ore, or separating the valuable material of an ore from the waste material, for further processing or direct use. It can not only dramatically improve the value of mineral exports but also leave a long-term legacy beyond mining. India, for example, used to be the largest diamond-producing country in the world, until the mines were exhausted around the turn of the century. A thriving legacy of diamond cutting and polishing businesses, however, remains based on imported rough diamonds.

11.5.5. *Involving the private sector: Corporate social responsibility*

In the absence of sound policies and in countries where enforcement of laws and regulations is weak, voluntary corporate codes can play an important role. Through the influence of processes such as the Mining, Minerals and Sustainable Development study set in motion by the World Business Council for Sustainable Development (IIED/WBCSD, 2002) and the subsequent creation of the business association International Council on Mining and Metals (ICMM), the mining sector's contribution to sustainable development has made several advances. Commitments are well ahead of most developing country national industry norms. These developments have partly been in response to pressure from civil society and shareholder groups in both OECD countries and developing countries.

Characterised as enclave operations in the past, leading mining companies are moving towards greater community engagement and support to community development (ESMAP/World Bank/ICMM, 2005). The success of these initiatives will be improved if local authorities have stronger capabilities to work alongside companies as equal partners.

Box 11.4. **The Extractive Industries Transparency Initiative**

The Extractive Industries Transparency Initiative (EITI) is a partnership between the private sector, civil society and governments from both industrialised and developing countries. The objective is to increase transparency in payments made by companies to host governments and in receipts by host governments from the companies. East Timor, Nigeria, Azerbaijan, the Democratic Republic of Congo and Ghana are among the countries now actively engaged in the EITI initiative. As a result of EITI, Nigerians could in 2006 for the first time find in their newspapers a fuller picture about the oil revenues, USD 8.9 million in 2004, being collected by the government.

Source: http://eitransparency.org, accessed in March 2007.

Box 11.5. **Three key elements of good governance**

Enforceable and transparent contracts. A transparent and enforceable set of mining contracts (within the bounds of commercial confidentiality) together with transparency over revenue payments and receipts will enable a country's civil society to hold its government to account for the way in which national mineral assets are being developed and spent.

Stable macro-economic policies. To achieve high economic growth-rates and avoid the Dutch disease effects (*i.e.* appreciation of exchange rates making exports of other commodities uncompetitive), governments should follow prudent fiscal and monetary policies and reduce foreign debt. Should rents and exports be so high that they run the risk of appreciating the country's currency, a long-term investment fund could be instituted for the benefit of future generations, when the mineral supply is depleted.

Diversification. Given that mines are by definition depleting finite resources, diversification into other economic activities is vital. A diversification of the economy should be accompanied by a broadening of the tax base, so that the government revenue is not restricted to a limited range of commodities.

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PART II

Chapter 12

Renewable Energy and Pro-Poor Growth

Access to energy is one of the keys to development and economic growth. However, current systems are not able to provide energy to all in a sustainable and affordable way. This chapter explores the role that renewable energy can play in providing a more sustainable and secure energy supply and support the achievement of the MDGs.

12.1. Overview

Access to energy is one of the keys to development and economic growth, as it provides light and heat, and powers productive machinery and telecommunication equipment. Yet in spite of admirable accomplishments in providing energy for human purposes, it is increasingly clear that current systems are unable to provide energy to all people in a sustainable and affordable way. It is estimated that 1.6 billion people (Flavin and Aeck, 2005; ITDG, 2004) do not have access to modern forms of energy, most of them living in rural areas in developing countries, far from centralised energy systems. Fossil fuel-based energy systems also contribute to greenhouse gas emissions and climate change. Hence recognition is growing that new patterns of energy supply and consumption are needed to move towards more sustainable development.

This chapter explores the role that renewable energy can play in providing a more sustainable and secure energy supply for sustaining economic growth and supporting the achievement of the MDGs.[1] More specifically, it addresses the following two questions:

- What are the potential benefits of renewable energy in supporting pro-poor economic growth and development?
- What policies and measures are needed to harness the potential benefits of renewable energy in supporting pro-poor economic growth and development?

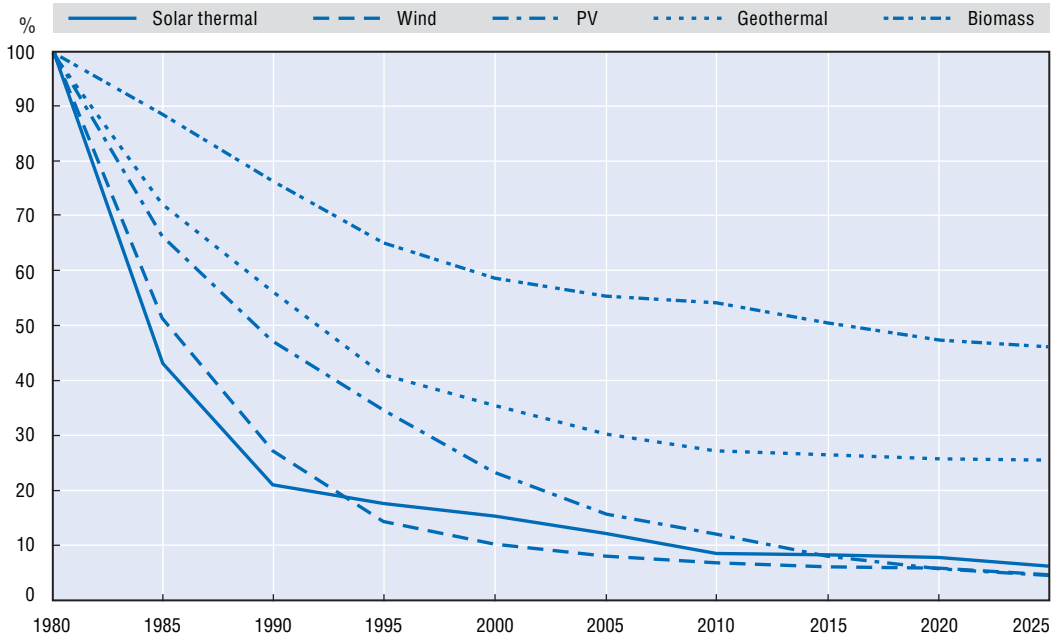
12.2. Recent trends in renewable energy: Renewables on the rise

Over the past decades conventional energy options, largely based on fossil fuels, were seen as economically more attractive than renewable energy applications. However, the economic case for various forms of renewable energy is improving rapidly. Three important trends are favouring renewable energy:

First, the volatile world market prices for conventional energy sources, in particular oil, pose great risks for large parts of the world's economic and political stability, with sometimes critical effects on energy-importing developing countries. Concerns have been expressed that the rising cost of oil, which exceeded USD 140 a barrel in 2008, may slow down recent economic progress in Africa and lead to tighter financial constraints (AfDB, 2006). Moreover, dependence on imported fuels leaves many energy-importing countries vulnerable to disruption in supply, which might pose physical hardship and an economic burden for others. This situation has encouraged many countries to look for alternatives to make them less vulnerable to shocks in the fossil fuel markets.

Second, in the last few years, renewable energy technologies have experienced substantial improvements in cost, performance and reliability, making them competitive today with conventional energy sources in a range of applications. Figure 16 shows how the cost of electricity generation from renewable energy sources has dropped significantly over the last 25 years and it is expected to decrease further in the coming years.

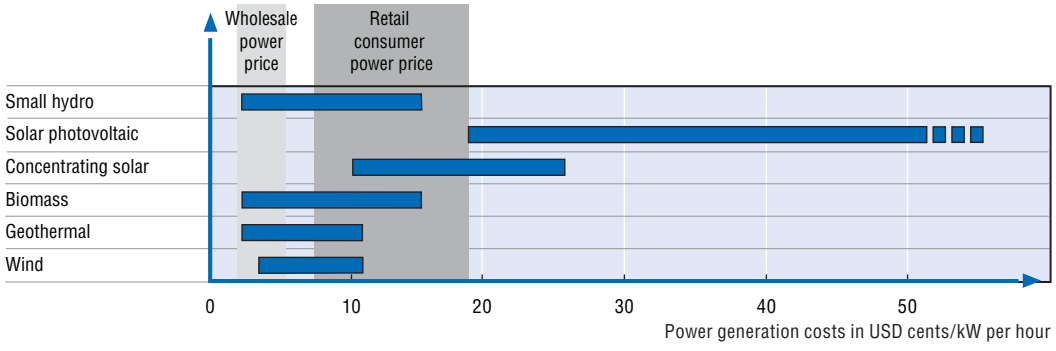
Figure 12.1. **Renewable energy: Electricity generation costs as a percentage of 1980 levels, historical and projected**



Source: UNDESA (2005).

The steady fall of prices for renewables has considerably improved the cost competitiveness of several renewable energy options, making them better placed to compete on the energy market. According to the OECD/IEA, small hydro-power and biomass are already competitive in many wholesale electricity markets whereas, in certain regions, wind and geothermal energy is cheaper than conventional energy sources on the retail consumer market (Figure 12.2). Other technologies, such as solar (photovoltaic or PV), solar water heaters and biomass, are often the most cost-effective options to provide energy services in off-grid areas in developing countries.

Figure 12.2. **Cost competitiveness of selected renewable power technologies**



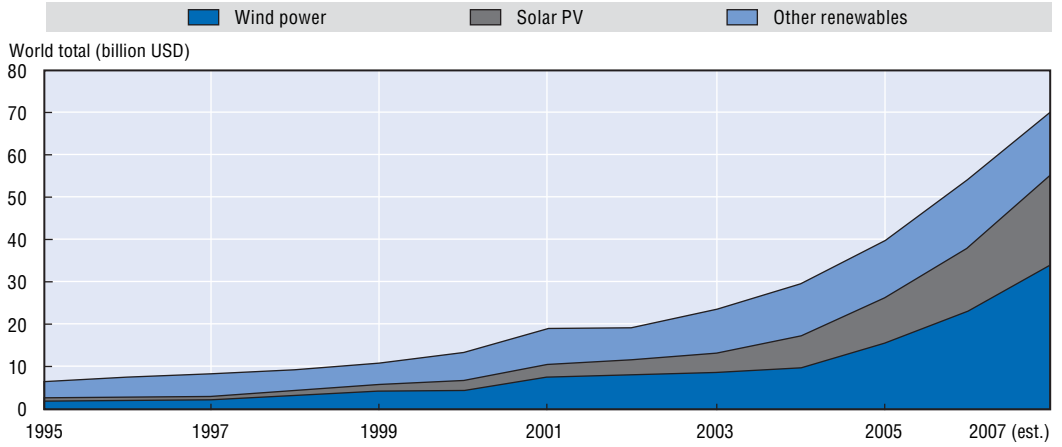
Source: Renewable Energy: RD&D Priorities, OECD/IEA (2006).

Third, according to the most recent assessment report from the Intergovernmental Panel on Climate Change, there is very high confidence that human activities, primarily the combustion of fossil fuels, are responsible for the global warming trend which has been

observed over the past decades. The evidence is also increasingly showing that climate change will eventually damage economic growth, mostly in developing countries. In a recent publication, Sir Nicholas Stern has shown that the benefits of strong, early action on climate change, among other things through the promotion of renewable energy, will outweigh the cost of dealing with the effects of climate change in the future (Stern, 2006).

Taken together, the volatility of the oil markets, the increased cost competitiveness of renewable energies and the growing concerns about the future costs of climate change have thrown new light on the use and potential of renewable energy sources. Policy makers and investors alike have increasingly turned their attention to renewable energy and recent years have seen a steady increase in investment in renewable energy (Figure 12.3) with a record investment in new renewable energy capacity of USD 55 billion in 2006 (REN21, 2008).

Figure 12.3. **Annual investment in renewable energy world total, 1995-2007**
(USD billion)



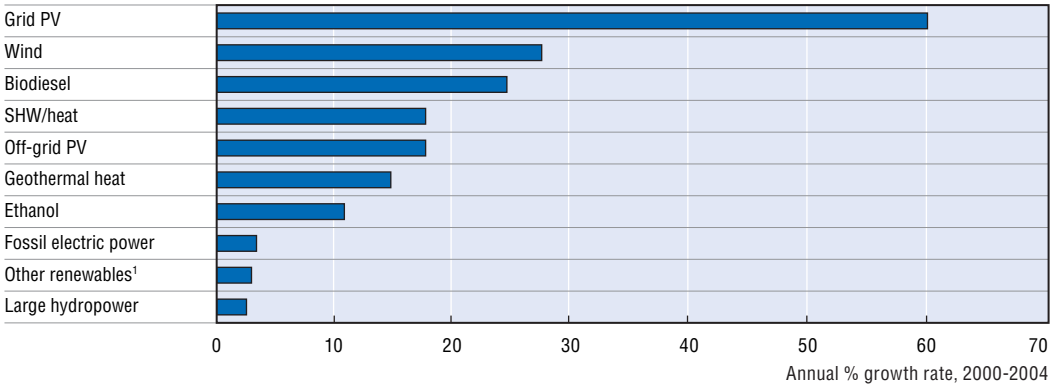
Source: REN21 (2008).

In fact, renewable energies, led by wind, biodiesel and photovoltaic technologies, represent the fastest growing of all energy industries. The worldwide annual growth rate for grid-connected solar PV, for instance, was as high as 60% between 2002 and 2004 (Figure 12.4) and according to market analysts this trend is likely to continue in the future (UNDESA, 2005).

In spite of these advances, the main markets for renewable energy today are in the industrialised countries (with the limited exception of emerging economies such as Brazil, China and India, which have developed markets in biofuels and wind energy).

In developing countries, and especially in Africa, 2 billion people depend on traditional biomass such as wood and dung for cooking and heating, with associated impacts on health, particularly for women and children (UNDP, 2000). Modern renewable energy technologies such as solar, wind, micro-hydro and geothermal resources, remain largely untapped, despite the relative abundance of sunshine, wind, water and underground thermal heat. The figure below gives an overview of the energy potential for solar energy and wind energy in different regions around the world. Globally, Africa accounts for almost half the potential in solar energy and nearly a quarter of the potential in wind energy.

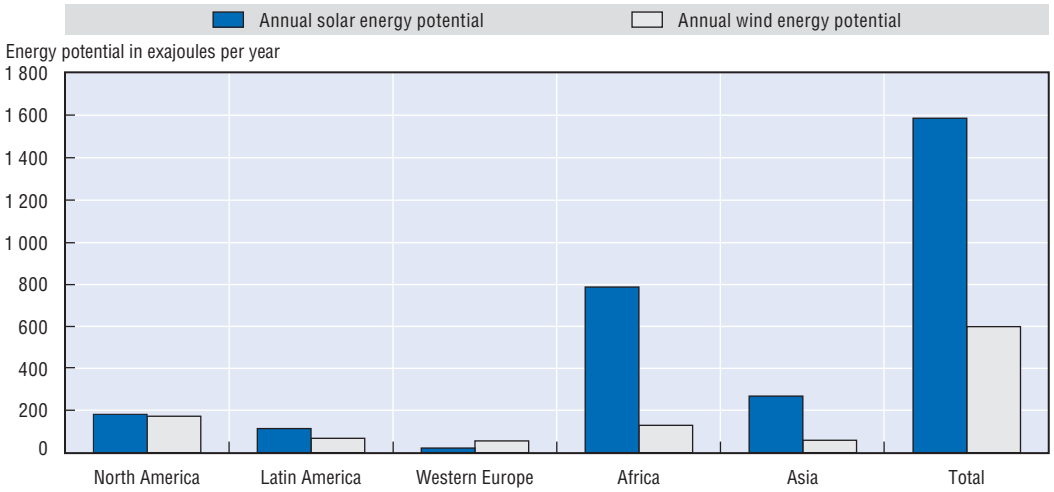
Figure 12.4. **Renewable energy growth rates (UNDESA, 2005)**



1. Geothermal, biomass and small hydropower.

Source: REN21 (2005); OECD/IEA (2004).

Figure 12.5. **Technical potential for solar and wind energy in selected regions**



Source: UNDP (2000).

Africa is also home to more than 15% of the world's potential in geothermal energy, and estimates show that potentially the continent can add more than 80 exajoules of energy from biomass to its energy budget, more than four times as much as all industrialised countries combined (UNDP, 2000).

Box 12.1. **Geothermal energy potential in Africa**

Geothermal energy is the natural heat from the earth's interior stored in rocks and water within the earth's crust. At an international level, approximately 8 100 MW of geothermal power are generated, out of a global potential of 60 000 MW.

Geothermal power exploitation has numerous advantages over other energy sources. Among its benefits are the near zero emissions (true for modern closed cycle systems that re-inject water back to the earth's crust), and the small amount of space required for geothermal power development compared with other energy sources such as coal-fired plants. Geothermal power plants require approximately 11% of the total land used by coal-fired plants and 12% to 30% of land occupied by other renewable technologies.

Box 12.1. **Geothermal energy potential in Africa** *(cont.)*

Kenya was the first country in sub-Saharan Africa to exploit geothermal energy on a significant scale. At present, the country has exploited 57MW of its total potential and plans are underway to increase electricity generation from geothermal energy to 576MW by 2019. Ethiopia's geothermal power installed capacity is 8.5MW, although less than 2MW has been tapped so far.

	Potential generation in MW
Kenya	2 000
Ethiopia	> 1 000
Djibouti	230-860
Uganda	450

Source: Karakezi and Kithyoma (2003).

12.3. What role can renewable energy play in supporting pro-poor growth?

No country has been able to develop its economy beyond subsistence level without access to more than a minimum level of modern energy (G8, 2001). In fact, none of the MDGs can be met without major improvement in the quality and quantity of energy services in developing countries (World Bank, 2005).

Energy is needed for household cooking, lighting and heating; to power small industries and enterprises; to run health centres; to light schools; to power communication technologies; and to fuel transport systems. Renewable energy can play an important role in meeting these development challenges, especially in rural areas for which access to centralised systems is a distant prospect.

One advantage of renewable energy is that it can provide cost-effective and reliable energy services to people in the rural areas where a large part of the world's poor people live. Conventional approaches to electrification, for example through centralised power plant and power line distribution, often by-pass rural communities because they are located too far from the grid, making it too costly to reach them (ITDG, 2004). According to a World Bank study of several developing countries, the cost of grid extension to rural areas typically ranges from USD 8 000 to USD 10 000 per kilometre, not including the cost of materials, which adds an additional USD 7 000. This high cost, coupled with very low capacity utilisation of such grids because of very small loads, makes extension economically unviable for utilities (Flavin, 2005).

Various renewable energy options exist for providing decentralised energy services in rural areas in a cost-effective way. These include, for instance, solar home systems, wind pumps, solar dryers, small hydro, biofuels and village scale mini-grids. The main advantage of such localised energy services is that they can make use of locally available energy resources (sunshine, wind, water and biomass) and therefore avoid the high costs associated with installing extensive grid connections.

The introduction of renewable energy technologies can promote economic development and increase the welfare of people in rural areas. Box 12.2 illustrates how the installation of a micro-hydro system in Nepal has benefited local communities in various ways and has spurred economic growth in the area.

Box 12.2. **Cost-benefit analysis of a micro-hydro system in Nepal**

The Daunekhola micro-hydro system was installed in 1998 with support from the Rural Energy Development Programme (REDP), a joint undertaking of the United Nations Development Programme (UNDP) and the government of Nepal. The programme involves 116 households in the community in Pinthali and makes use of a micro-hydro system with a power capacity of 12 kW, using water from the nearby Daune Khola river.

The installation of the Daunekhola micro-hydro system improved the economic welfare of the community in several ways. Lighting with the new system both reduced household expenses and generated additional income. Electrification has had a positive effect on the health and education of households. It also makes household chores easier and increases the capacity for interaction among members of the community. Access to information through radio and television is another benefit. With increased industrial activity, two jobs have been created in the village. Significantly, an increase in agricultural productivity has been realised through irrigation made possible by the water flowing out from the system. A cost benefit analysis assesses the total present value of the system at about NPR 20 000 000 (Nepalese rupees) or about USD 250 000.

Source: Gorkhali (2005).

Another important advantage of renewable energy systems is that, after the initial investments for installing the system, operational and maintenance costs are relatively low compared with those of conventional energy systems. This can benefit small entrepreneurs by reducing the overall costs of running their businesses and make them less vulnerable to fluctuations in fossil fuel prices.

The potential economic benefits from investing in renewable energy will vary from country to country and from case to case and depend on the appropriate mix of renewable energy used (solar, wind, geothermal, hydro-power or biomass). Nevertheless, experience from the past has shown that adding renewable energy to the energy portfolio of a country can have two major benefits.

First, at the national level, as the use of renewable energy largely depends on locally available resources, it can reduce the need for imports of fossil fuels and as such improve the balance of payments of oil-importing countries. In addition, an increased use of renewable energy can also diversify the energy portfolio of a country and improve price stability in times of rising fossil fuel costs. This leads to enhanced energy security and a more reliable and sustainable energy basis for fuelling economic growth.

Second, at a more local level, studies have indicated that the increased use of renewable energy can offer important opportunities for the creation of local employment and income generation activities through production, distribution, marketing, maintenance and servicing of renewable energy technologies. According to a study from Goldemberg (2004), renewable energies can create up to 116 229 jobs per TWh (terawatt hour) produced as compared with 1 145 for conventional energies (oil, coal and natural gas).[2]

It should also be noted that renewable energy technologies do not solely consist of the expensive, hi-tech solutions of industrialised countries. Locally-developed technologies for delivering fundamental energy services, such as efficiency-improved cooking stoves (built with soil as the main construction material), have been found to provide substantial

economic benefits by saving on both fuel costs and time spent collecting fuel, thereby liberating money time for investment in human development.

Environmental impacts should be taken into account when considering appropriate energy options. Ecosystems support energy systems through services such as water flows for hydro-power and biomass production. Renewable energy technologies are only "renewable" if they do not erode the ecosystems upon which they depend. Every energy production system, even those considered to be "environmentally friendly", has some impact on ecosystems. Degradation of ecosystems will affect future energy choices and potential for their sustainable development.

Box 12.3. **Sustainable small-scale biofuels promoting rural development in Kenya**

While large-scale biofuel development raises concerns over rising food prices, deforestation and competition over land, the potential for small-scale biofuel production to improve energy security and promote rural development should not be ignored. One project in Kenya explores the potential for using the seeds of the jatropha plant as a source of biodiesel and other valuable by-products. A crucial feature of jatropha is that is can be grown on non-agriculturally productive land and requires little water, thereby minimising competition with food crops. By producing biofuel feedstock in addition to food crops, smallholder farmers can generate their own energy sources and increase food production efficiently. Financial risk is also reduced by diversifying income from solely perishable food crops. Biodiversity values can also be enhanced if biofuels are produced on degraded lands such as those abandoned after grazing.

However, the qualities that make the jatropha plant attractive for cultivation also imply invasive tendencies. Careful management and planning is required to contain this risk. Jathropha is not a panacea which will work for every community in every country. Alternative bioenergy choices appropriate to local communities' conditions should be explored.

Source: Presentation by "Trees on Farm Network, World Agroforestry Center in Kenya" made CSD 15 side Event, New York 2 May 2007. Report available at *www.iucn.org*.

12.4. Policies and measures for harnessing the potential benefits of renewable energy

Despite the availability of renewable energy resources (sunshine, wind, biomass and hydro) and the clear benefits for stimulating pro-poor growth, renewable energy has not yet realised its potential on the ground. The main reason for this is that the existing energy markets include a number of obstacles that frustrate the development of markets for renewable energy for the poor.

This paragraph will discuss some of the policies and measures that can be taken by national governments better to harness the potential benefits of using renewable energy. As a complete discussion of the possible policies and measures that are available to governments is beyond the scope of this chapter, the focus will be on those policies and measures that might have direct beneficial effects on poor people's access to energy.[3] These include:

- creating the right environment for attracting private investment;
- establishing a pro-poor playing field for decentralised energy technologies;

- developing renewable energy sector policies and measures;
- installing small-scale financing systems for renewable energy;
- bridging the gap between development projects and small local entrepreneurs.

12.4.1. *Attracting private sector investment*

As was noted above, the potential of renewable energy has been discovered by the capital markets. Private investment in, for instance, grid-connected wind parks and biofuel plantations, is rising sharply. In order to be able to benefit from the current interest in renewable energy projects, governments may consider attracting renewable energy investors as part of their private investment promotion policies. Apart from generic institutional and regulatory frameworks, governments could consider specific policies, including long-term power purchase agreements. Box 12.4 provides the example of how India successfully created the right investment climate for attracting private sector investment in wind energy projects.

Box 12.4. **Wind energy in India**

Over the past couple of decades, shortage of power has emerged as one of the major constraints on growth in India. From enjoying a power surplus in the 1950s and 1960s India has moved to a situation of shortage since the mid-1970s, and has experienced severe energy deficiencies since then. Since India is relatively poorly endowed in terms of conventional energy resources, it has started to look into the potential of energy generation from non-conventional energy sources, especially wind and solar power.

The government of India initially gave impetus to grid-quality power generation by wind turbine technology in the 7th National Five Year Plan (NFYP), which ran from 1985 to 1990. Since then, wind power generation has won a positive response from industries, entrepreneurs and the business community. By the start of the 8th NFYP, grid-quality wind power generation had become the thrust of India's ministry of non-conventional energy services (MNES). The MNES has formulated a series of policy incentives and fiscal incentives that have been successful in the development of the wind power sector. On top of this policy, individual state governments have added supplementary incentives. This total package of incentives has created an attractive investment climate, which has spawned a surge of investment in the sector. In 2003, India stood fifth in the world wind energy rankings, with over 1 700 MW of installed capacity, distributed over the states of Tamil Nadu (61%), Gujarat (14%), Maharahtra (12%), and Andhra Pradesh (7%). The private sector has dominated investment (97%) in these regions.

Source: Television Trust for the Environment (2005), *www.tve.org/ho/doc.cfm?aid=1678&lang=English*, accessed 16 November 2007.

12.4.2. *Creating a pro-poor playing field for decentralised energy technologies*

Several decentralised renewable energy technologies have become commercial products on the international market. These include, for instance, solar home systems and micro hydro generators, solar dryers, and lately also highly efficient wood stoves. To promote distribution of these technologies to the dispersed poor, governments can put into place measures that minimise the investment burden. This can be done by applying specific import duty waivers and has been carried out in, for example, Kenya and Mali (Box 12.5).

Box 12.5. **Promoting solar photovoltaic systems in Africa**

The main market for solar photovoltaic systems in Africa can be found in Kenya, where over 200 companies and thousands of technicians are involved in promoting small solar systems for rural households. Imported solar panels are installed in combination with locally manufactured batteries to power small television sets and electric lights and to charge mobile phones. The government has promoted the development of the market by waiving import duties and VAT. The solar systems have accordingly become directly affordable for the rural poor, leading to a massive market with over 200 000 systems installed to date. In Mali, the government has taken a similar measure for the promotion of the rural application of solar home systems for a period of five years. Also, the government of Tanzania has waived duties on solar equipment since 2001. Both countries have observed a rapid growth of the solar market.

Source: Vleuten, Stam, Plas (2007).

12.4.3. Developing renewable energy sector policies and programmes

Building a supportive macro-economic framework, as described above, may not be enough to ensure rapid introduction of renewable energy technologies. Building awareness and human capacity and creating incentives for developing an efficient and competitive private sector requires specific attention. Therefore, additional ***renewable energy sector policies and measures*** may be required, for instance to support the creation of a renewable energy sector, and to improve the quality level of a local renewable energy market. These can include, for instance, business development support, training, and technical standards and regulations. On the international level there is a significant base of aggregated experience of renewable energy policies and programmes from which governments can learn. Donors can support respective knowledge transfers. The World Bank, for example, has compiled such information in its Renewable Energy Toolkit.

12.4.4. Small-scale financing for renewable energy

Because of the high up-front costs of most renewable energy options and the low cash capacity of poor households, mechanisms, regulation and institutions which provide innovative ***small-scale financing*** should be stimulated in order to reach the poor. The financing can either be channelled directly to poor households or indirectly to local entrepreneurs serving those households. For small-scale micro-finance institutions that provide micro-credit or enterprises that lease equipment and use prepaid meters for fee-for-service provision seem to be the most promising options. The effectiveness of various consumer loan models is probably country-specific, and depends on cultural, financial and legal factors. Boxes 12.7 and 12.8 describe some experiences from different small-scale financing schemes in the pro-poor renewable energy market.

12.4.5. Bridge the gap between large scale development projects and small-scale electricity providers

Large-scale government and international donor efforts to provide technical and financial support for the development of the energy sector are important. However, local entrepreneurs in the informal sector hold the key to energy service provision in the early stages. Local entrepreneurs have low operating costs and can adapt quickly to changing markets but often work in isolation without business support and with limited technical

Box 12.6. **Improving energy access in rural Argentina with renewable energy**

Jujuy is one of 24 provinces of Argentina, located in the northwest part of the country with many rural, poor communities. Before 1996, all electricity services in the area were provided by the provincial energy department, an arm of the provincial government, and were either not reliable or did not reach many rural areas. With the passage by parliament of two laws in 1995-6, the electricity sector was reformed, privatising the distribution of electricity. However, the government then mandated that small or remote villages and sparsely populated areas that could not be feasibly connected to the national grid should be given electricity access (which the central government would subsidise). If the company failed to provide the rural market with the quantity and quality of services specified, it could be penalised by losing the concession for the grid-connected market, which was clearly the more lucrative investment. To respond to rural access challenge, the newly privatised company, Empresa Jujeña de Sistemas Energeticos Dispersos (EJEDSA), provided small hydro-systems, diesel-powered systems (gensets), hybrid PV-wind mini-grid systems, and small solar home systems (SHS) to the area. After almost nine years of continuous work, including undergoing an economic crisis, EJEDSA increased the number of rural connections in Jujuy province by 3 400, benefiting close to 14 000 inhabitants in the region. The majority of these were provided with access to renewable energy (mainly SHS), and the electricity supplied was of sufficient quantity and quality to provide basic illumination and social communications. The results obtained to date indicate that the privatisation of public utilities can, under some circumstances, serve as the most efficient model for development of a renewable energy-based electricity supply in remote areas.

Source: UNDESA (2005).

Box 12.7. **PSAES: The German-Senegalese Photovoltaic Project**

Where private energy entrepreneurs cannot serve the pro-poor market because of low revenues, NGOs sometimes fill the gap with specific payment schemes to supply the largest possible target group with energy access. Studies of villages that had access to electricity supply for a number of years showed that high subscription costs were preventing many households from effectively gaining access. In Diaoulé and Ndiébel this barrier was addressed by the German Senegalese Photovoltaic Project, adapting electricity tariffs to the ability of different groups to pay. As illustrated by the table, three groups were identified. The differentiated prices are shown in the right column.

Group	Income source	Cost of access (euros)
Poor	Agriculture only	4.5
Middle	Agriculture and cash transfers/payments in kind	9
Well-off	Trades and employees (teachers, nurses, etc.)	22

The power stations are managed by village committees that deal with protection of the facilities, billing, requests for connection, system extension, elimination of fraud and payment collection. As a result, the access level is now 93% in Diaoulé and 98% in Ndiébel. All of the households connected use electricity for lighting and around 2.5% also use it for productive purposes (*e.g.* selling ice and fresh drinks, engaging in crafts, etc.).

Source: Sarr and Thomas (2005).

Box 12.8. **Solar home system electricity provision: Yeelen Kura, Mali**

Yeelen Kura, meaning "new light" in the Bambara language, aims to supply electricity to some 5 000 households spread across 20 villages in the cotton-growing region of Koutiala through the introduction of solar home systems, using a fee-for-service approach. The customer "hires" the SHS and pays a service fee monthly in advance. Yeelen Kura retains ownership of the SHS and takes responsibility for the cost of maintenance. This ensures that the SHS will continue to work in the longer term. The service fee depends on the size of the SHS and the amount of the subsidy.

In Yeelen Kura, three service levels have been introduced, varying from two to four power points and, if chosen, a connection for radio/TV, for five hours a day. Customers pay a fee that depends on the service level for which customers opt. Fees for the services are determined in such a way that in principle they are affordable by the customer. The fees are comparable to the cost of the lamp oil, candles and batteries, for example, that the SHS replaces and should reflect the costs of maintenance and operation of the company.

The head office of Yeelen Kura is in Koutiala, and some 15 local energy stores have been set up in bigger rural villages within a radius of 400 km, where one or two employees are stationed. Out of 35 employees, 20 are responsible for installing, maintaining and, if necessary, repairing the systems, collecting the monthly fees, and carrying out the local book-keeping. They also have a commercial responsibility. In the future these rural energy stores will also be able to offer other energy services.

Source: NCDO, 2006.

and financial management skills. This leads to a disconnection between local activities and large-scale donor and government efforts. This gap can be bridged by systematically building the capacity of small and medium-sized enterprises, by promoting decentralised approaches and by more directly encouraging the participation of local entrepreneurs and investors in the design and delivery of energy services.

12.5. Conclusion

Governments and investors are increasingly interested in renewable energy technologies. Apart from their great potential to satisfy the non-served energy needs of the poor in a sustainable way, they offer attractive economic benefits and an opportunity for job creation.

The case studies presented above show how governments of various countries have succeeded in developing the right policies and programmes for the successful adoption of renewable energy technologies. Successful countries attribute their success to a combination of an active government and a committed private sector.

National governments have demonstrated successful support of renewable energies through measures in the fields of attracting foreign direct investment, developing supportive fiscal policies, developing sectoral programs, and supporting small-scale financing for renewables.

In addition, the international policy environment is becoming increasingly supportive of oil-independent and climate-neutral (low carbon-emitting) energy sources. With various renewable energy technologies now mature and with their introduction challenges

increasingly well understood, it would be sensible to consider the increased application of these technologies.

Notes

1. It should be noted that renewable energy should be used in conjunction with energy efficiency as the two are highly complementary. Renewables increase the supply of energy services, and efficiency reduces the demand (UNDESA, 2005).
2. Photovoltaic energy is usually generated (and used) in small modules of 100 watts and the generation of 1 TWh would require typically 10 million modules to be installed and maintained.
3. It should be noted that each country has unique circumstances and should design its own system, and combination of policies, based on needs, circumstances and available resources.

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