

# CHAPTER 1

## Introduction

### Why Natural Resource Management Matters

The importance of natural resources in Africa's development process cannot be over-emphasized. These resources have become more important than ever before as countries seek additional sources of development financing in order to progress towards the Millennium Development Goals (MDGs). Even so, the fact remains that Africa has failed to tap the potential for its natural resources wealth to serve as a driver for industrialization, economic growth, poverty reduction and sustainable development. Indeed, many African countries are rich in natural resources, but this has not always been a blessing, especially for countries with considerable mineral resources. This has become a persistent challenge for sustainable development and natural resource management in Africa. The continent is endowed with natural resources, which it badly needs for its own development, but which others also want. Furthermore, for most African countries several decades of resource exploitation have not, for the majority of the countries, translated into economic growth or improved the livelihoods and welfare of their growing population.

Africa's record of poor management of its natural resources has been a recurring theme in recent debates on the "natural resource curse" associated with many resource-rich countries. Although natural resource wealth contributes to economic development in some resource-rich African

countries — attributable to effective management — the story is different in many other countries on the continent. With a few exceptions, resource exploitation in Africa has worsened socio-economic conditions and, in some cases, ignited protracted conflicts that have taken a heavy toll on national economies. This has led to the emergence of initiatives aimed at promoting transparency in natural resource management. These include the Extractive Industries Transparency Initiative (EITI), the Publish-What-You-Pay initiative and the Open Society Initiative, all aimed at addressing problems limiting the contribution of the natural resources sector to economic growth and poverty reduction.

So why is natural resources management in Africa important, and why is it important at this time? The reasons are several. First, the *volatility of resource revenues*: The huge revenues from Africa's commodity exports are volatile and are subject to large price fluctuations in global markets. These revenues are often temporary and thus require sound fiscal policies to ensure good investment in human capital development and in the development of long-term production capacity. Over the decades, this has proved to be a challenging task. One of the key challenges is how to transform temporary resource revenues into productive capital that will induce and sustain growth over the long-term.

Second, because of their undiversified economies, many resource-rich African

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countries are prone to real *exchange rate appreciation* induced by rising resource export revenues. This hampers the prospects of non-resource exports in these countries. Indeed, the sheer volume of resource revenues diverts attention from export diversification. This may result in the neglect of labor-intensive manufacturing exports and the import of more goods and services using resource windfalls, at the expense of local production of import substitutes. Furthermore, the recent rise of China and India has created new challenges that make it even more difficult for Africa to carve out a *niche* in labor-intensive manufacturing exports.

Third, natural resource management has re-emerged as critical in Africa because of the challenges of *transparency and accountability*, which remain crucial for harnessing natural resource wealth for economic growth. Against a backdrop of inadequate checks and balances, resource revenues have induced rent seeking and corruption on a massive scale. This undermines the quality of institutions and of governance in resource-rich African countries. Transparency in allocating exploitation rights and in controlling revenues and how they are spent are major concerns. Indeed, policy-makers and development practitioners have been grappling with the fact that natural resource extraction has *not* led to sustainable increases in socio-economic development in a significant number of resource-rich countries, contrary to rational economic expectations. Instead, natural resources are being depleted faster than the rates at which other real assets are being built up.

Fourth, and even more importantly, natural resource management is now crucial

for Africa because there is strong evidence that it can make an important, and sometimes critical, contribution to *economic growth* and *poverty reduction* in the continent. Indeed, natural resource revenues contribute to socio-economic development and poverty reduction in several ways. Most of the linkages are direct and include income generation and growth creation opportunities through lateral or downstream businesses. Indirect linkages concern investments — for instance, improvements in physical infrastructure — which, in turn, enhance social services and have other positive effects. Indeed, natural resources constitute the base for the infrastructure and energy needs of society, the industrial sector, urban development and social wellbeing. However, these contributions are contingent on the fulfillment of critical conditions, chiefly, improving governance and transparency, and eliminating corruption. This is crucial given the evidence that resource mismanagement serves as a recipe for protracted civil conflicts, which do not only debilitate economies, but also lead to state fragility and institutional collapse.

Based on current evidence few countries in Africa have managed their natural resources in ways that have benefited the majority of their populations — with the exception of mainly Botswana, Namibia and South Africa. Over the years, these three countries have implemented solid economic reforms aimed at managing the proceeds and utilizing the resources accruing from the extractive industries. In most of the other countries, however, natural resource wealth seems to end up in the hands of a few, with

limited visible benefits for the poor. State stability seems to be a characteristic of countries that have properly managed the use of their resources, while instability and state fragility have emerged as a tendency in countries with poor resource management records — Sierra Leone, Democratic Republic of Congo (DRC) and Angola are examples. Rekindled attention to natural resource management in Africa is an imperative, given the discovery by many African countries of new and extractable resources and the pervasive experience of what is now termed the *natural resource curse*.

This renewed interest in natural resource management clearly focuses attention on one critical question: how can Africa use its resources to foster economic growth and poverty alleviation, given the aforementioned complexities and trade-offs? Although the continent badly needs its resources to sustain and propel its emerging growth, it lacks the technical and financial means to extract the resources. Foreign investment therefore plays a critical role in the exploitation of Africa's resource on a competitive scale, especially with the emerging Asian markets, notably India and China. In this complex scenario, it is reasonable to posit that what Africa gets out of its resources will largely depend on knowing what Africa wants. This proposition leads to another crucial question: where can natural resources take Africa — towards resource dependence, or can the resources serve as a springboard for sustained economic development? The search for answers to this question makes natural resource management a key concern in Africa.

## Natural Resources and Sustainable Management

Conceptually, natural resources are stocks of physical assets that are not produced goods and that are valuable to humans. A resource may be considered valuable because of its sheer existence, or because it produces a flow of services or benefits that can be used in production, trade, or consumption. Natural resources are classified as follows:<sup>1 2 3</sup>

- 1) **Raw materials** (renewable, semi-renewable, and non-renewable) are minerals, fossil energy carriers, metal ores, and biomass, which are needed for most human activities. Fossil energy carriers, metal ores, and minerals such as gypsum and china clay are considered non-renewable because their stocks are finite (on a human time scale). In contrast, biomass, which includes quickly renewable resources such as agricultural crops and slowly renewable resources such as timber is, in principle, renewable within the human timeframe. However, biological resources that are used as raw materials can be exhausted if they are overexploited. This is an acute threat to commercially fished marine species, for example.
- 2) **Environmental media** — such as air, water, and soil — sustain life on Earth and produce biological resources. In contrast with raw materials,

<sup>1</sup> EEA (2005)

<sup>2</sup> CEC (2003)

<sup>3</sup> Zeeuw (2000)

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their declining quality is the main concern: the issue is not how much there is, but what state they are in. For example, the quantities of air and water on earth do not change within human time scales, but their quality is often poor because of pollution. Moreover, the biological diversity of environmental resources is of great importance.

- 3) Renewable resources may have a permanent character (for example, solar and wind energy) and are then labeled flow resources. **Flow resources** cannot be depleted but they need other inputs or resources to be exploited. For example, energy, materials and space are needed to build wind turbines or solar cells.
- 4) Physical **space** is needed to produce or sustain all the above-mentioned resources. Land-use, for human settlements, infrastructure, industry, mineral extraction, agriculture and forestry, is an example. Table 1.1 presents a broad classification of natural resources.

Natural resources are further classified according to their rate of **regeneration** as renewable, semi-renewable, or non-renewable. **Renewable resources** are resources that are regenerated on a human time scale and renewed periodically in the context of ecological cycles. Their use can only be increased to a certain extent otherwise overexploitation will occur. However, as long as exploitation is not exhaustive, renewable resources can be used for an infinite period. Therefore, for resource use to be sustainable, the consumption rate should

remain within the capacity of the natural system to regenerate (or renew) in a human relevant period. Examples of renewable resources are water, fisheries, wildlife, and forests. These types of resources are often interconnected within ecological systems; for example, water is needed for forest growth and fisheries. **Semi-renewable** resources are in an intermediate stage of their possibility to renew or to deplete.

**Non-renewable resources** have a regeneration rate of zero or regenerate over a very long period.<sup>4</sup> Non-renewable resources can be recyclable (for example, minerals, and oils used in plastics) or non-recyclable (for example, oil used as fossil fuel). They are less likely to participate in the circular flows of the ecosystem, and exploitation of one resource usually does not affect the availability of other resources (as long as extraction does not destroy the other resources). The use of these resources to provide material and energy leads to depletion of the Earth's reserves since these resources do not renew in human relevant periods. Table 1.2 presents a summary of resources based on their regeneration rates.<sup>5</sup>

Natural resources may also be classified in terms of their use values based on whether they are **extractive** (natural resource products) or **non-extractive** (natural resource services). Extractive resources are subject to some process of physical removal from their natural surroundings and perhaps physical transformation during their use. Non-extractive resources are resources that yield services without being removed

<sup>4</sup> Lujala (2003)

<sup>5</sup> Steiner et al. (2000)

**Table 1.1: Broad Classification of Natural Resources**

Resource	Type	Description
Renewable Raw Materials	Living	Living resources that can re-stock/renew themselves, e.g. fish, forests
	Non-living	Resources that can renew themselves, but are non-living; include soil and water
Non-Renewable	Metals	Include non-ferrous, base and precious metals
	Non-Metals	Include ferrous, non-ferrous minerals and industrial minerals as well as precious stones and uranium
	Fossil Fuels	Coal, oil and natural gas
Environmental Media	Air	General 'biological' reproducing resources but could be polluted or degraded
	Water	
	Soil	
Space	Land Area	Includes space for human settlement, infrastructure, industry, mineral extraction, agriculture and forestry
Flow Resources	Geothermal	Renewable resources that do not need regeneration
	Wind Energy	
	Tides	
	Solar Energy	

Source: Adapted from EEA (2005)

from their natural setting.<sup>6</sup> Table 1.3 summarizes the use values of natural resources with relevant examples included.

Another strand of the literature defines natural resources according to their geographical concentration and "lootability".<sup>7</sup> In this context, natural resources are defined according to their geographic concentration

when the question relates to whether they are *diffuse* or *point*. In other words, is the availability of the resource restricted to geographically small areas or does it span larger areas? For example, forests cover wide areas and are therefore considered to be diffuse resources. Point resources are highly concentrated and do not cover a significant area on a map. For example, many minerals occur in small areas, and these deposits are represented as points on

<sup>6</sup> Field (2000)

<sup>7</sup> Lujala (2003)

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**Table 1.2: Classification of Natural Resources Based on Regeneration Rate**

	Time for Regeneration	Environmental Resources	Energy Resources	Material Resources
Renewable	<1 year, controllable by humans	Agricultural products (non permanent) pollution of water and air	Solar energy, water, ethanol	Salt
Semi-renewable	1–200 years, no human influence	Fish, forests, ground water, (permanent) pollution of water and air	Geothermal energy, water, firewood	Soil
Non-renewable	No economic relevance	Ozone, endangered fauna and flora	Oil, gas, coal, uranium	Minerals

Source: Adapted from Steiner et al. (2000)

a map. Point resources are commonly associated with higher rents than diffuse resources and thus provide incentives for rent seeking. In the literature, abundant point resources are often associated with higher risk of conflict.<sup>8 9</sup>

Ross (2002)<sup>10</sup> defines natural resources according to their “lootability”, “obstructability” and “legality” and forms hypotheses on how these three resource characteristics affect civil war. Ross defines lootability in terms of the ease of resource extraction and transportation. As such, lootable resources include alluvial gemstones, agricultural products, and timber, while deep-shaft minerals and gemstones, oil and natural gas are not. Ross also differentiates between the

ease of transporting the natural resource product and the ease of blocking the available mode of transportation (that is, its obstructability). For example, diamonds or drugs that are flown from a production area are not obstructable, while resources that are transported by trains or trucks are moderately obstructable. Resources transported by pipelines (such as oil and gas) are the most obstructable.

Natural resources are natural capital assets and are not provided by human activity, but their quality and capacity to yield goods and services, and therefore their value as productive inputs, are affected by human activity. 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, and

<sup>8</sup> Addison et al (2001)

<sup>9</sup> Addison & Murshed (2001)

<sup>10</sup> Ross (2002)

**Table 1.3: Classification of Natural Resources Based on Value Uses**

	Natural resource products and services	
Natural resource	Extractive	Non-extractive
Minerals	Non-fuel (bauxite) Fuel (coal)	Geological services (weathering)
Meteorological services	Energy resources (geothermal)	Energy resources (solar) Global radiation balances Radio spectrum Natural disasters
Land	Fertility	Space, scenic values
Water	Municipal and industrial supplies, irrigation	Recreation (boating)
Fisheries	Food (saltwater and freshwater fish)	Recreational services (recreational fishing, whale watching)
Terrestrial animals	Food and fiber (farm animals, wild game) Biodiversity products (genetic variability)	Recreational services (bird watching, ecotourism)
Plants	Food and fiber (agricultural crops, wild food crops) Biodiversity products (medicinal plants)	
Forests	Forest products (timber)	Recreation (backpacking) Ecosystem protection (flood control, CO2 sequestration)

Source: Adapted from Field (2000)

so on). Renewable capital produces a flow of goods and services. Goods produced from renewable natural capital include timber and non-timber forest products and wild caught fish. Goods produced from non-renewable natural resources are mainly oils and minerals. Some of these goods are traded in formal markets and are therefore accounted for in national economic

statistics, including timber and fish harvested by formal-sector operators as well as fossil fuels (oil, gas, and coal) and other important minerals. However, many are consumed directly by local inhabitants, including wild fruits, mushrooms or herbs, wild fish caught by small-scale fishermen, “bush meat”, palm, timber, and non-timber forest products. Services produced from

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

The key challenge concerning renewable resources is how to ensure **sustainable exploitation**; in other words, how to ascertain that extraction rates do not exceed regeneration capacity. In many cases, however, there are multiple sustainable equilibrium rates of extraction. There is often a tradeoff between the objectives of maximizing the economic value of resource extraction, maximizing associated employment opportunities, or maximizing food production.

In light of the above analysis, it is clear that careful use and **management** of resources is the basis for sustainable development. This conclusion has gained international recognition, for example, at the recent World Summit on Sustainable Development (WSSD) in Johannesburg, it was agreed that “protecting and managing the natural resource base of economic and social development are overarching objectives of, and essential requirements for, sustainable development.” Natural resources are too often used in unsustainable ways, resulting in production systems that show declining returns to inputs. Land degradation is a case in point: the bulk of Africa’s productive land — up to two-thirds — is vulnerable to degradation. Increasing population pressure, technologies applied in unsuitable situations, badly managed or inappropriate access regimes, droughts and the general insecurity associated with access to resources all have a negative effect on agri-

culture, livestock, forestry and fisheries, and may cause wider conflicts. Climate change puts more pressure on natural resource use and increases insecurity among producers. In many parts of Africa, the natural resource base for agricultural production is affected by soil degradation (erosion, soil depletion, and desertification, for example), water scarcity, water quality reduction, siltation, deforestation, over-fishing and overgrazing. Good management of natural resources is therefore important for economic, socio-political, and environmental reasons.

**Natural resource management** (NRM) is a broad concept that involves integrating efficient resource use and preventing adverse environmental impacts. It also concerns questions about the use and distribution of resources for the sustainable economic development of all levels of government and for the benefit of the citizenry. NRM also involves the management of resource extraction or imports, production and consumption, and the resultant financial resources, wastes and emissions. The key objectives of such NRM include:

- ensuring adequate supply of, and efficient use of, natural resources for the creation of wealth and well-being in industry and society;
- avoiding overloading or destroying nature’s capacities for reproduction and regeneration of resources and absorption of residuals;
- securing the co-existence of society and nature;
- minimizing risks related to national and international insecurity and economic turmoil due to dependence on natural resources;

- contributing to economy-wide fair distribution of resource use and adequate burden-sharing;
- minimizing the problem of shifting between environmental media, types of resources, economic sectors, regions, and generations; and
- driving technological and institutional change in a way and towards a direction that provides economic and social benefits to all stakeholders.

The concept of **sustainable development** was first introduced in 1987 in the Brundtland Report as “development that meets the need of the present generation without compromising the ability of future generations to meet their own need”. This definition implies two equally important specific concepts: intra-generational equity (the requirement to meet the needs of the present) and inter-generational equity (the requirement not to compromise the satisfaction of the needs of future generations). Ideally, sustainable development should be development that generates optimal economic and social returns without impairing the long-term life-supporting capacities of ecosystems or reducing the chances of future generations to satisfy their own needs.<sup>11 12</sup>

This definition can be broken down into four conditions for sustainable development: (1) material needs, and other needs, for a better quality of life have to be fulfilled for people of this generation, (2) as equitably as possible, (3) while respecting ecosystem

limits, and (4) building the basis on which future generations can meet their own needs. Furthermore, sustainable development has four pillars: the economic, environmental, social, and governance pillars, with the fourth pillar fostering the integration of the first three. Therefore, if the natural resources sector is to contribute positively to sustainable development, it needs to demonstrate continuous improvement of its social, economic, and environmental contribution, with new and evolving governance systems.

Sustainable development also relates to the notion that boosting economic growth, protecting natural resources, and ensuring social justice can be complementary goals. Its key purpose is to help the poor live healthier lives on their own terms. Sustainable development also means development that combines economic growth with poverty reduction and protection of the environment. In other words, it involves achieving “economic growth and social development without degrading the potential of its conditionally renewable natural resources”.<sup>13</sup> The role of natural resources in ensuring sustainable development in Africa is critical given that economic growth and social progress depend on the natural resource base. This natural resource base cannot be conserved in light of the pervasive poverty in rural Africa. In addition, Africa is the only continent where the population is growing faster than the economy. Thus, people (especially the rural poor) over-exploit some natural resources in order to survive while many governments mismanage natural resources wealth — this complicates the

<sup>11</sup> WCED (1987)

<sup>12</sup> Eurowatch (2002)

<sup>13</sup> Young and Ryan (1995)

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issue of sustainable development in Africa. Efficient and effective natural resource management is therefore an imperative that will lay the foundation for sustainable development in Africa by producing maximum sustainable wealth that can generate an investible surplus for economy-wide growth as well as adequate resources to combat poverty and under-development.

### Scope and Outline

Given the broad coverage of natural resources, the analysis in this Report focuses on a selection of natural resources — fossil fuels, minerals (metals and non-metals), water, forestry and land use — and on relevant crosscutting issues such as climate change. The rationale for proceeding thus is the need to include a mix of renewable and non-renewable resources, ensure policy relevance and political and economic importance, illustrate the various management approaches adopted hitherto and outline key approaches to be adopted looking forward. Nevertheless, because of the renewed scramble to extract Africa's non-renewable resources, the Report will focus first and foremost on these.

The Report aims to deepen understanding of how to address problems related to natural resource development problems, and to highlight the need for better management at the regional, national and sub-national levels. This has become an imperative for improving the effectiveness of the joint efforts of key stakeholders — concerned governments, companies, donors and non-governmental or civil society organizations — to facilitate the realization of the full natural resource potential and capture resource wealth for the

promotion of economic development in Africa.

This Report is partly motivated by the realization that more needs to be done to translate the potential benefits of natural resources into broad-based socio-economic development in Africa. Despite this realization, the necessary policies and concrete actions are not integrated at present, at least not with binding commitments. Therefore, one of the overriding objectives of this Report is to articulate these issues and help identify key stakeholders, particularly governments, donors and private sector organizations to intensify engagements, actions, and dialogue on the role and contributions of natural resource wealth to economic growth and development. In pursuing this objective, the report builds on key lessons from successful and unsuccessful cases of government and other stakeholder engagements and partnerships at the international, national and the community levels.

The objectives of the Report can be grouped under the following four main areas:

1. Define, in operational terms, the contextual meaning of natural resources and how they relate to sustainable development and social outcomes. The Report examines the roles of the different players, along with crucial decision points in natural resource management on the continent. This entails reviewing whether decisions are made transparently and with what level of public accountability in relation to natural resource benefits. The role of good information and public participation in natural resource

issues is also examined, as well as the rights and responsibilities of private and public ownership and of access to natural resources.

2. Examine how close the main stakeholders are to embodying good management practices with respect to Africa's natural resources.
3. Advance the thesis that better natural resource management is one of the most direct routes to reversing Africa's poverty and economic malaise. The report posits that better management must translate into more inclusive processes for making decisions about natural resources, and that institutions must adequately integrate natural resource issues and concerns into their policies and decisions.
4. Propose concrete suggestions on how the various stakeholders involved in natural resource exploitation (at the local, national, and international

levels) can help improve public policies and governance in natural resource-endowed countries in Africa. In essence, this involves examining practical steps that can be taken by stakeholders — governments, industry, local communities, donors and others — to build beneficial factors where they are lacking.

The Report is organized into six chapters. Chapters Two and Three discuss Africa's renewable and non-renewable natural resources, respectively. Chapter Four examines Africa's natural resources as a paradox of plenty. Chapter Five presents the ways and means of making natural wealth work for the poor; and Chapter Six presents the main messages and the way forward in the effective and sustainable management and harnessing of Africa's natural resources wealth.