

# **Inequality, Poverty and the Environment in Kenya**

Moses Ikiara  
Samuel Mwakubo  
Godfrey Olukoye

*Productive Sector Division*  
Kenya Institute for Public Policy  
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© Kenya Institute for Public Policy Research and Analysis

Bishops Garden Towers, Bishops Road

PO Box 56445, Nairobi, Kenya

tel: +254 20 2719933/4; fax: +254 20 2719951

email: [admin@kippra.or.ke](mailto:admin@kippra.or.ke)

website: <http://www.kippra.org>

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## **Abstract**

*There is a growing body of theory and empirical evidence on the role of inequality in economic and social development. Inequality plays a role in poverty, growth and social stability. Following the post-election violence in 2008, inequality is perhaps the most important issue in Kenya. Degradation and overuse of environment and natural resources have also become a major policy concern. However, it is not clear how the two are related to each other. Does inequality contribute to degradation or does degradation of the environment and natural resources account for the glaring inequality in the country? The objective of this study is to explore the link between inequality and the environment. Literature review and interviews with key stakeholders were used to assess evidence on the link between inequality and the state of environmental and natural resources. The analysis reveals that there is differential dependence of environmental and natural resources, with the poor being more dependent than the non-poor. Women are most affected by degradation of environment and natural resources. Children are also vulnerable to degradation, as they are more exposed to indoor pollution and may lose school time as they search for water and firewood. The distribution of environment and natural resources is not equitable across the country, which accounts for significant regional inequality. There are regional differences in endowments of land, forests, fisheries, water and wildlife. Access to these resources differs among socio-economic groups and gender. Evidence suggests that the rich have relatively higher access than the poor. Women have less access particularly to land and fishery resources due to culture and social taboos. There is a vicious cycle between inequality and the status and management of the environment and natural resources in the country. The key causes of inequality include initial natural resource endowments in different regions, lack of or inadequate sector policies, inadequate legal and regulatory framework, social taboos and norms, general governance problems and political economy. Interventions that improve the management of the environment and natural resources and reduce inequality are desirable. Policies that reverse environmental degradation should not be pursued in isolation from socio-economic policies. There is need to harmonize environmental and developmental goals to ensure sustainability. Ongoing policy, legal and regulatory reviews provide an opportunity to introduce measures that reduce inequality, which include those addressing skewed access and use rights, corruption and poor governance, poverty, increasing economic growth, and a conducive policy environment for equitable resource allocation to regions via the national budget. Targeted policies that involve payment for environmental services by the rich and subsidies for the poor are beneficial. Regional inequalities should be addressed through government expenditures on public infrastructure, which can*

*help integrate the economy by linking up fragmented domestic markets for environmental goods and services. Moreover, the decentralized fund programmes (e.g. Constituency Development Fund), together with the policy on women employment in the public service and the Youth Fund, provide an opportunity to address the various types of inequality. The capacity of public institutions should be strengthened through additional financial and human resources. Increased collaboration with civil society organizations should be facilitated. Their capacity and that of the communities also needs to be strengthened to participate meaningfully in the policy formulation and governance process.*

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## **Abbreviations and Acronyms**

AG	Attorney General
AIDS	Acquired Immune Deficiency Syndrome
APHRC	African Population and Health Research Centre
ASALs	Arid and Semi-Arid Lands
BMUs	Beach Management Units
DANIDA	Danish International Development Agency
CBD	Convention on Biological Diversity
CBS	Central Bureau of Statistics
CDF	Constituency Development Fund
CDM	Clean Development Mechanism
DRSAS	Department of Remote Sensing and Survey
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ERC	Energy Regulatory Commission
FAN	Forest Action Network
FIDA-Kenya	Federation of Women Lawyers, Kenya
GDP	Gross Domestic Product
GEF	Global Environmental Facility
HIV	Human Immunodeficiency Virus
IFPRI	International Food Policy Research Institute
IMR	infant mortality rate
JICA	Japanese International Cooperation Agency
KFMP	Kenya Forestry Master Plan
KLA	Kenya Land Alliance
KNCHR	Kenya National Commission for Human Rights
KWS	Kenya Wildlife Services
MDGs	Millennium Development Goals
NEMA	National Environment Management Authority
NEPAD	New Partnership for African Development
NRC	Non-Residential Cultivation
PEI	Poverty-Environmental Initiative
PRA	Participatory Rural Appraisal

REA	Rural Electrification Authority
RRA	Rapid Rural Appraisal
RVF	Rift Valley Fever
SID	Society for International Development
SIDA	Swedish International Development Agency
SFR	Soil Fertility Replenishment
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environmental Programme
UNDP	United Nations Development Programme
URTI	Upper Respiratory Infections
VOCs	volatile organic compounds
WAB	Water Appeals Board
WCMA	Wildlife Conservation and Management Act
WRI	World Resources Institute
WRMA	Water Resources Management Authority
WSB	Water Services Board
WSRB	Water Services Regulatory Board
WSP	Water Service Providers
WSTF	Water Services Trust Fund

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## **1. Introduction**

There is a growing body of theory and empirical evidence on the role played by inequality in economic and social development (SID, 2004). Inequality matters for poverty, growth and social stability and is likely to be critical in the attainment of the Millennium Development Goals (MDGs) (McKay, 2002). Following the post-election violence witnessed in Kenya in 2008, inequality has become perhaps the most important issue in the country. Degradation and overuse of environment and natural resources have also become a major policy concern in the country. However, it is not clear how the two concerns are related to each other. In other words, does inequality exacerbate environmental problems? Or does degradation of the environment and natural resources account for some of the glaring inequality in the country?

Central to the inequality-environment relationship is the wide acknowledgement that degradation of the ecosystem tends to: (i) harm rural populations more directly than the urban counterparts, and (ii) have its most direct and severe impact on the poor (WRI, 2003). The poor do not have appropriate tools and means for coping with environmental degradation. The wealthy control access to a greater share of services available from the ecosystem; they tend to consume these at higher per capita rates, and they are buffered from unavailability of such services by their capacity to pay higher prices for the scarcer services and/or purchase substitutes (WRI, 2003). Lack of well-defined property rights, power, human capital and political linkages make the poor to be deprived access of natural resources to the advantage of powerful agents like the state, large firms or influential individuals. This study attempts to establish inequality-poverty-environment links in Kenya from existing literature and discussions.

### **1.1 Objectives of the Study**

The broad objective of this study is to explore evidence of the relationship(s) between inequality, environment and poverty in Kenya.

The study has five specific objectives:

- (i) To investigate the status of the environment by region in the country, including identifying the hot spots in terms of the areas most affected and with the most serious environmental issues;
- (ii) To determine the level of dependence on environmental and natural resources by region, gender and different socio-economic groups;

- (iii) To investigate the distribution of and access to environmental and natural resources in Kenya by region, gender and income groups;
- (iv) To investigate whether institutional factors (such as property rights and governance) influence access to environmental and natural resources, and their implications to environment, poverty and inequality; and,
- (v) To investigate how informal and formal legal and regulatory environmental framework(s) influence access to and use of natural resources, and their implications on poverty and inequality.

## **1.2 Linkages Between Inequality and the Environment**

### *What is inequality?*

*Inequality* may be defined as the degree to which distribution of economic welfare generated in an economy differs from that of equal shares among its inhabitants. It usually refers to income, social exclusion, and the inability of certain population groups to access key social services and resources.

In contrast, *poverty* refers to the proportion of people whose standard of living falls below a defined poverty line. Poverty, too, has many dimensions that go beyond income, such as sickness, chronic pain, exhaustion, exclusion, insecurity, powerlessness, lack of access to information and institutions, lack of self-confidence and voice, and psychological suffering (Narayan *et al.*, 2000). Poverty also encompasses deprivation, lack of access to social services and lack of participation in political, social and cultural institutions and decision making (WRI *et al.*, 2007). It is, therefore, evident that poverty and inequality are closely related.

The definition of inequality focuses on differences between individuals in terms of opportunities, processes and outcomes. Some of the easily observed inequality outcomes include wealth, employment and education differentials. Some inequality outcomes may arise from the normal functioning of the market economy while others may arise from differences in where people live, parental circumstances and gender, among others.

Income inequality may affect the households' demand for goods provided by the commons, their opportunity cost of time, or their demand for regulation (Baland, Bardhan and Boyles, 2007). Asset inequality also matters; for instance, while land ownership determines one's gains from collective irrigation scheme, the number of fishing boats owned affects

one's long term gains from voluntary reductions in fishing efforts. Ethnic and social heterogeneity are also relevant, particularly where collective rules and organizations have to be set up. Gender inequality also affects performance. In Kenya, the most important dimensions of inequality include income, regions (province)<sup>1</sup> and gender (SID, 2004).

A recent study (SID, 2004) shows that the level of inequality is very high in Kenya; hence it is a key policy concern in the country. In recent times, the Gini coefficient rose from 0.45 in 1994 to 0.49 in 1997 and 0.57 in 1999 (SID *et al.*, 2006). It is thus hardly surprising that inequality has become a key socio-economic issue in the country.

A major concern is the interaction between the different dimensions of inequality with dimensions of natural and environmental resources, which include quantity, quality and time. How this interaction is influenced by population pressure remains unknown. Therefore, the study focuses on three dimensions of inequality (income, regional<sup>1</sup> and gender) and three dimensions of resources (quantity, quality and time).

Kenya's Sessional Paper on Gender (Government of Kenya, 2006) significantly attributes the unequal status between women and men to socio-cultural attitudes held by men and women and their socialization. Existing laws and customs have further limited their access and control over resources.

### *Why does inequality matter for growth and poverty reduction?*

Inequality influences the economic and social development of a country in various ways, including effects on economic growth, poverty, social stability, and morality and ethics (Box 1.1).

### *Why does inequality matter for environmental sustainability?*

While the link between poverty and the environment has been well studied (see Reardon and Vosti 1995; Duraiappah, 1998; Horowitz, 1998), research focusing on the relationship between social or economic equality and ecological sustainability remains rare. However, there are recent important contributions by Baland, Bardhan and Bowles (eds) (2007), Adhikari and Lovett (2006), Varughese and Ostrom (2001), Adhikari (2005) and Agarwal (1998). Some studies assert a positive relationship between socio-economic equality and sustainable resource use and governance (Budhathoki, 2004; Trawick, 2001), while others point to the adverse equity effects of a focus on efficiency in resource

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<sup>1</sup>In the Kenyan context, a region often refers to a province.

**Box 1.1: Why inequality matters?**

Inequality matters for poverty: If a country's development strategy is based on widespread growth strategy or on a progressive distribution of income, this will have a significant impact on how that country is able to reduce poverty levels among various groups in society.

Inequality matters for growth: A country's initial level of income distribution is an important determinant of future growth prospects. Countries with high levels of inequality—especially of assets—may achieve lower growth rates on average. Inequality can inhibit growth and slow down poverty reduction.

Inequality matters for social stability: Inequality is often a significant factor behind crime, social unrest or violent conflicts, which may threaten a country's long-term social and political stability.

Inequality often undermines the political process: This may lead to an inadequate social contract and may trigger bad economic policies—with ill effects on growth, human development, and poverty reduction.

Inequality matters in its own right: Inequality matters purely on normative grounds and from a moral and ethical point of view. Ideally, people would want to live in a society where everyone is more or less equal and having comparable opportunities in life.

Inequality may undermine civic and social as well as political life, and inhibit kinds of collective decision making. At the societal level it may also generate its own self-justifying tolerance, perpetuating high inequality equilibrium despite the potential economic and political costs.

*Source: Society for International Development (2004)*

use and governance (Chatterton and Chatterton, 2001; Smith, 2004; Banerjee *et al.*, 1997).

Besides this literature, the Norwegian Nobel Committee had drawn the world's attention to the strong link among the environment, governance and peace (Maathai, 2007). The Committee recommended the expansion of the definition of peace and security to include good stewardship of limited resources and their equitable distribution. This was based on the realization that “many conflicts and wars are over access, control and distribution of resources such as water, wood fuel, grazing ground, minerals and land” (Maathai, 2007).

The poor, particularly those living in rural areas, often rely on a variety of natural resources and ecosystem services as a direct source of livelihood and for a significant share of their incomes (Cavendish, 2000; Narrain *et al.*, 2005). They also rely on ecosystem services that indirectly maintain or diversify their livelihood options through maintenance and enhancement of productivity and a stable environment. Examples of ecosystem services that support livelihoods include the following: provision of natural habitat for wild pollinators that are essential to food crops, natural predators that control crop pests and soil organisms

important to agricultural productivity; watershed protection and hydrological stability, including recharging water tables and buffering extreme hydrological conditions, which prevents droughts or floods; maintenance of soil fertility through storage and cycling of essential nutrients; and, breakdown of waste and pollutants.

When ecosystem functions are impaired, this inevitably reduces livelihood choices and increases poverty. Increasingly, the rural poor live in areas of high ecological vulnerability and relatively low levels of biological or resource productivity such as sub-tropical drylands or steep mountain slopes. Thus, both environmental conditions and access to a variety of natural resources are crucial to the ability of poor people to sustain their livelihoods. Indeed, poor people's perceptions of well being are strongly related to the environment in terms of their livelihoods, health, vulnerability, and sense of empowerment and ability to control their lives.

The relationship between growth and the environment and how it affects the poor and efforts to reduce poverty is also important. The environmental soundness of growth is critical to the livelihood opportunities of the poor, and countries with similar levels of income and growth can have quite different levels of environmental performance.

While there is no simple relationship between growth and environment, there are many examples of bad environmental management adversely effecting growth—a number of fisheries have collapsed or are in near collapse (UNEP, 2002), agriculture has declined due to salinization from irrigation (World Bank, 2006) and upstream deforestation and erosive agriculture have had downstream impacts (World Bank, 2002). These short-run growth paths are bad for long-run growth, besides having high social and environmental costs.

### **1.3 Conceptual Framework**

The fact that rural households in developing countries depend significantly on the environment and natural resources for their livelihoods has led to the perception that such resource stocks serve as a public asset for poor households, substituting for private assets (land, livestock, farm capital, human capital, financial wealth) that they lack. This, in turn, has raised the policy question of whether improved natural resource management can form the basis of policies aimed at inequality reduction and poverty alleviation.

The relationship between inequality and environment can be analyzed from the theories of externalities, public goods and institutions. Externalities arise when certain actions of producers or consumers cause unintended effects on other producers and/or consumers. Externalities

may be positive or negative. Positive externality arises when an action by an individual or a group confers benefits to others. Negative externalities arise when an action by an individual or group produces harmful effects on others. For instance, the production and consumption decisions (e.g., on levels and patterns) of the rich people may impose costs on the poor who were not party to those decisions. In such a case, the rich may take advantage of weak governance to acquire and convert forests into agricultural and residential use. The poor, who rely more on the natural environment for clean water and energy, then bear the cost of the lost forest.

Most natural resources are public goods. These goods are non-rivalry and non-excludable in nature and are, therefore, subject to free rider problems. As a result, they are under-supplied and often over-exploited. Environmental problems such as pollution, depletion and degradation of natural resources arise because the environment and natural resources are public goods.

Markets for environmental goods and services do not exist or when they exist, the market prices underestimate the social scarcity values of these goods and services. Two important reasons for non-existence of the markets are: (a) difficulty in defining, distributing and enforcing property rights, and (b) high costs of creation and operation of markets (transaction costs). For environmental resources such as clean air, water in rivers and springs, oceans and the atmosphere, property rights are not well defined. Users of these resources consider them as “free goods” or “unpaid for” factors of production. Therefore, they impute zero prices for using them in their private decisions even when their social scarcity values are positive.

The critical role of institutions in the management of the environment and natural resources is best understood from the theory of institutions. The New Institutional Economics (NIE) considers that the cost of transacting—determined by institutions and institutional arrangements—is the key to economic performance. Under NIE, some of the unrealistic assumptions of neo-classical economics (such as perfect information, zero transaction costs, full rationality) are relaxed, but the assumption of self-seeking individuals attempting to maximize an objective function subject to constraints still holds.

The purpose of the NIE is to explain both the determinants of institutions and their evolution over time, and to evaluate their impact on economic performance, efficiency and distribution (Nabli and Nugent, 1989). In line with this, many formal and informal institutions have been used to manage the environment and natural resources in different societies. Depending on how the institutions are, the outcomes have a bearing on the state of environment and natural resources and inequality. In traditional societies, institutions controlling access that tended to

favour the powerful accelerate inequality. Even modern institutions perpetuate marginalization of the poor.

There are multiple and complex links between inequality and the state and management of the environment and natural resources. In this study, a few of the possible and potential links are shown in Figure 1.1.

The relationship between inequality and the environment works in two directions. On one hand, the state and management of the environment and natural resources influences inequality through increase in poverty and reduced economic growth. The poor are the most vulnerable and the rich tend to exploit natural resources relatively more. However, a growing number of studies are finding a u-shaped relationship between household incomes and the amount of resources harvested from common-pool resources (Narain *et al.*, 2005), implying that tackling poverty may reduce environmental degradation up to a point, after which there will be increased environmental degradation.

On the other hand, inequality affects the status or health of the environment and natural resources through growth reduction and increasing poverty, failure to cooperate,<sup>2</sup> consumption of environmental goods,<sup>3</sup> pecuniary emulation and conflicts among others (Figure 1.1). As Shanmugaratnam (1996) observed, enforceability and rights of individuals under common property may break down as inequality increases. It would seem that sustainable common property resource management is more difficult to achieve in an unequal community. Conflict destroys or impairs incentives for productive economic investment and innovation at all levels.

Theories of relative deprivation assume that conflict arises as a result of inequality, which leads to grievances and despair among relatively disadvantaged groups, hence a motive for rebellion (Gurr, 1970; 2000). There is, therefore, a kind of vicious cycle in which environmental and natural resource degradation (decrease in quantity and quality) increases inequality (i.e., of income, region and gender), which in turn drives further environmental and natural resource degradation.

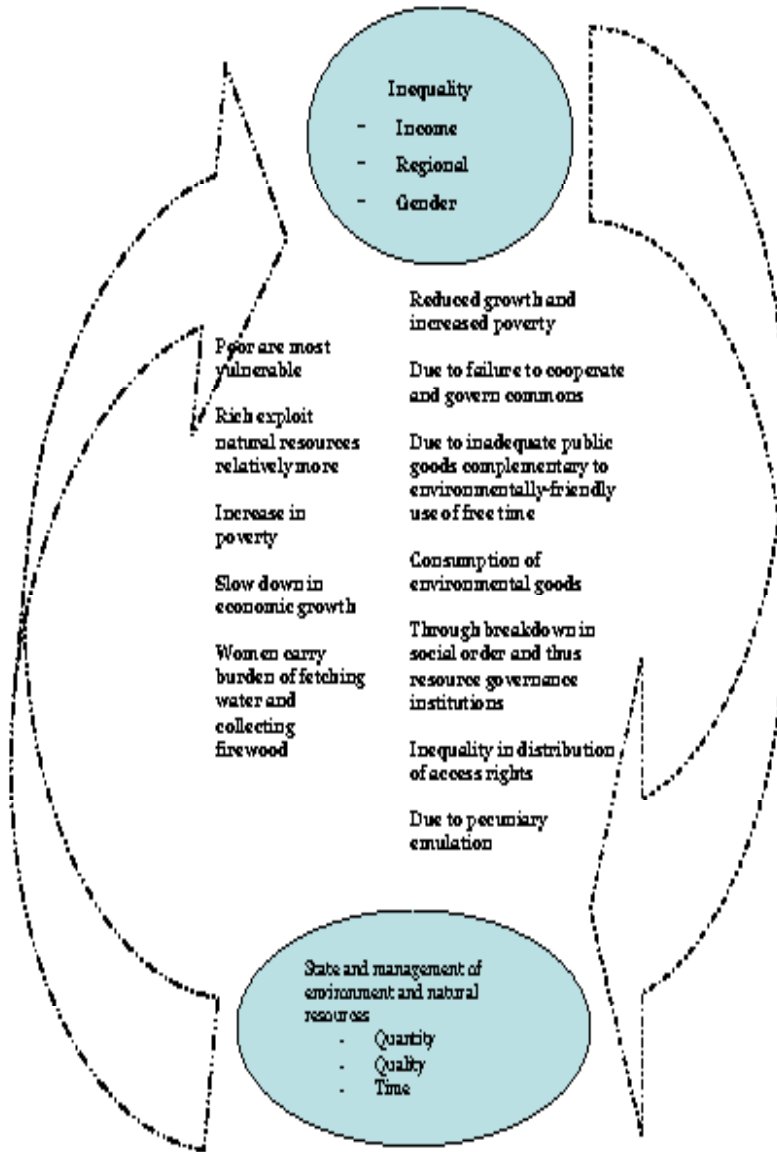
Kenya's Nobel Peace laureate Prof. Wangari Maathai alluded to this at the memorial lecture for Rajiv Gandhi when she said: "The poor are often caught in a vicious cycle of living in a degraded environment and

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<sup>2</sup>As Baland and Platteau (2007) argue that regulation tends to be more difficult to design and implement in the presence of inequality, hence leading to a poor state of environment and natural resources.

<sup>3</sup>Redistribution of income from the rich to the poor could worsen the environment if the consumption foregone by the rich had little environmental impact, while the increased consumption of the poor imposed substantial environmental cost. This requires that the marginal impact on the environment decreases with income (Baland, Bardhan and Bowles, 2007).

**Figure 1.1: Inequality and the environment—the channels**



*Source: Authors construction from literature*

remaining poor or getting poorer.” Lumley (1997) argues that villages with the lowest rate of inequality and also the lowest poverty rate have the highest soil conservation adoption rates. Boyce (1994) elaborates on the impact of inequality in wealth and power on individual time preferences, with specific reference to environmental goods. He argues that inequality leads to higher rates of time preference for environmental goods among both the rich and poor; in the case of the poor for the standard reasons



advanced (e.g., imperatives of day-to-day survival) preclude making long term investments. However, in the case of the rich, Boyce (1994) argues that inequality breeds feelings of insecurity among the wealthy based upon a fear of reallocation, and thus motivations to consume more in the present. Additionally, inequality shifts the asset portfolio selection of the wealthy to external rather than domestic sources, resulting in a need for rapid domestic environmental good depletion to support acquisition of external assets (Boyce, 1994).

There is a limited consensus on these channels or links. This is partly due to the diversity of equality dimensions (Rae, 1981; Sen, 1995; Velded, 2000) and the potentially different impacts that social, political and economic inequalities have on ecological outcomes (Dayton-Johnson, 2000), and the difficulties in generating measures of all equality dimensions and their diverging effects on resource outcomes (Prasad *et al.*, 2006). There are thus substantial gaps in what is known about many aspects of the inequality-poverty-environment links.

Despite some isolated efforts to study the relationship between equality and sustainability more rigorously, existing studies are typically based on single or few cases drawn from a single country. The generalizations one can offer on the basis of these studies are ambiguous at best. Indeed, this seems to be the obvious message from the work on the commons concerned with heterogeneity, collective action and ecological outcomes. However, one of the central inferences to be derived from available studies is the importance of institutions in shaping resource governance outcomes as they are influenced by inequalities. Indeed, most of the causal mechanisms identified in the above studies on inequalities and resource-related outcomes are built around how heterogeneities and inequalities have an effect on collective action and institutions— it is through such impacts of institutions that resources are affected and ecological outcomes produced.

#### **1.4 Overview of Poverty and Inequality in Kenya**

Poverty and inequality in Kenya have been on the increase over the years and the trend seems to be getting worse. The proportion of people living below the poverty line and who predominantly subsist on natural resources increased from 48 per cent in 1994 to 52 per cent in 1997 and 57 per cent in 2003. This has been caused by the poor performance of the Kenyan economy and worsening income distribution. According to the 1997 Welfare Monitoring Survey III (WMS III), the absolute poverty line stood at Ksh 2,648 (about US\$ 35) per adult per month in urban areas and Ksh 1,239 (about US\$ 17) per adult per month in rural areas.

Poverty in Kenya has many dimensions that vary substantially across space, time and various socio-economic groups (Kenya, 2005). Poverty estimates by Mwabu *et al.* (2002) show that rural poverty is higher than urban poverty. The estimates show that while the national headcount index increased from 52.3 per cent in 1997 to 56.8 per cent in 2000, rural poverty increased by about 6.7 percentage points compared with 2.3 points for urban poverty. However, the most recent integrated household budget survey shows the proportion to have declined to 45.9 per cent in 2005/06 (KIHBS, 2005/06).

Income inequality in Kenya has been increasing, with the top 10 per cent richest people in the country earning about 43 per cent of total income and the bottom 10 per cent poor earning less than 1 per cent (Table 1.1). The most affected regions are North Eastern, Western and Coast Provinces. There is also a wide regional variation in poverty rates, with Nyanza being the poorest province and Central Province better than all the others. Nairobi, Nyanza and Rift Valley provinces have the widest rich-poor gap. However, recent poverty figures show that Coast and North Eastern provinces have worsened significantly while others have improved.

Kenya ranks among the world's most unequal societies; the national level of inequality increased from 0.45 in 1994 to 0.57 in 1997 (SIDA, 2002). Using the headcount index to establish the poverty index among the 210 political constituencies in Kenya, the Government of Kenya

**Table 1.1: Poverty<sup>4</sup> and income inequality by province in 1999 and 2005/06**

Province	Poverty incidence (%)	Absolute Poverty (%) 2005/06	HDI <sup>5</sup>	Gini coefficient (Income)	Proportion of income accruing to			
					Top 10%	Bottom 10%	Top 20%	Bottom 20%
Nairobi	44	21.3	0.773	0.586	45.2	1.61	63.5	3.94
Central	31	30.4	0.637	0.516	39.47	1.07	55.51	3.35
Coast	58	69.7	0.518	0.511	33.77	1.34	50.16	4.33
Eastern	58	50.9	0.531	0.571	42.34	0.94	58.86	3.04
N.Eastern	64	73.9	0.285	0.439	26.57	1.48	47.08	4.7
Nyanza	65	47.6	0.468	0.563	42.81	0.63	60.69	2.15
Rift Valley	48	49	0.528	0.575	42.58	0.79	59.76	2.46
Western	61	52.2	0.516	0.586	41.08	0.66	59.07	2.27
Kenya	53	45.9	0.532	0.571	42.72	0.76	59.17	2.51

*Source: SID (2004) and Kenya National Bureau of Statistics-KNBS (2006)*

<sup>4</sup> Apart from column 3 and 4 the rest are figures for 1999

<sup>5</sup> Human Development Index

(2005) reported a poverty index in the range of 16 per cent to 84 per cent, representing the least poor and the poorest constituencies, respectively. According to this survey, Kabete Constituency in Central Province is the least poor, while Ganze Constituency in Kilifi District, Coast Province, is the poorest in the country.

## **1.5 Methodology**

This paper is largely based on existing literature, both published and unpublished, and on secondary data. Sources include relevant newspaper articles, annual reports and magazines. Key institutions were visited to look for relevant but unpublished work, which also presented an opportunity for limited discussions with stakeholders on the importance or otherwise of studying the relationship between environment and inequality.

The key institutions visited were the National Environmental Management Authority (NEMA), International Centre for Research in Agro Forestry (ICRAF), International Livestock Research Institute (ILRI), and Kenya Fisheries and Marine Research Institute (KMFRI).

## **2. Poverty, Inequality and Natural Resources in Kenya**

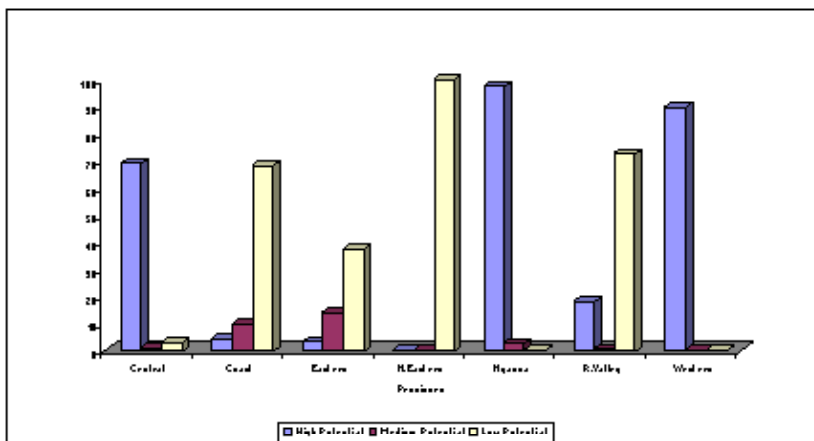
This section discusses the status of selected environmental and natural resources and how they are related to poverty and inequality in the country.

### **2.1 Land**

Kenya has a total land area of 56.9 million hectares, about 17.5 per cent of which is either high or medium potential. Only about 8 per cent of the total land area is arable. However, Kenya has a lower average population-to-cropland ratio than sub-Saharan Africa in general, with an estimated 160 ha of land for every thousand people compared to 280 ha, respectively.<sup>6</sup> The amount of land available to each person in Kenya has decreased from 9.6 ha in 1950 to 1.7 ha in 2005. It is projected that available land will further decline to 0.3ha per person by 2050 (UNEP, 2009). The sub-division of land into smaller units encourages overuse and degradation and has led to low agricultural productivity and decline in land investments (Syagga, 2006).

There are large regional inequalities in terms of land quality (Figure 2.1). The Rift Valley Province has the largest area (in absolute terms) with high and medium potential land for agricultural production. Western,

**Figure 2.1: Distribution of land quality in Kenya**



*Source: Based on Statistical abstracts (various)*

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<sup>6</sup> IFPRI (2007). "Facts on Ethiopia, Kenya and Uganda". International Food Policy Research Institute, [http://www.ifpri.org/media/lfl\\_facts.htm](http://www.ifpri.org/media/lfl_facts.htm). Accessed on 12 October 2008.

Nyanza and Central provinces have the least area (in absolute terms) but a big proportion of their total land is high potential. The three provinces are also the most densely populated in the country (Table 2.1).

The proportion of rural poor households without land differs widely across the country, with the highest being in Central Province (15.8%) and the lowest in Western Province at 6 per cent (Table 2.1). The problem of landlessness was significantly reduced between 1994 and 1997 except in Eastern Province (Table 2.1) due to resettlement. For the rural non-poor, Coast Province leads with the proportion of landless households at 41 per cent compared to Eastern Province at 10.2 per cent (SID, 2004).

In the Coast region, over 60 per cent of the residents are squatters, while 62 per cent are below the poverty line.<sup>7</sup> In Taveta Division of Taita-Taveta District, about 68 per cent of the land is privately-owned by two individuals, making approximately 30,000 of the division's 55,880 residents' squatters (KLA, 2004). This has serious implications on social stability and also on land conservation, improvements and investments due to lack of sufficient incentives.

There is high inequality in the ownership of the arable land in the country. According to Kenya Rural Development Strategy (2002), 3,600 large landowners control 39 per cent of all arable land in the country, while 3.5 million smallholders share less than 50 per cent of the arable land, giving them an average of 1.2 ha per household. The majority of households with farms smaller than 2 ha in 1997 were found to be in Central, Nyanza, Western and Eastern provinces (Table 2.1).

There has been an overall increase in land inequality in Kenya based on reported size of ownership (Table 2.2). There was a 36 per cent

**Table 2.1: Average land holdings**

Region	Average farm holding (% of population)							
	1994				1997			
	Landless	0.01-1.99ha	2-3.99 ha	4.0 + ha	Landless	0.01-1.99ha	2-3.99 ha	4.0 + ha
Central	27.4	65.3	5.6	1.7	15.8	49.7	24.7	9.8
Coast	49.4	32.4	10.5	7.7	13.3	19.3	33.2	34.2
Eastern	11.5	55.6	17.4	15.5	11.4	26.3	28.5	33.8
Nyanza	10.6	64.0	15.9	9.5	9.9	32.4	35.9	21.8
Rift Valley	26.8	46.5	14.0	12.7	14.3	28.2	26.3	31.2
Western	7.5	69.1	16.1	7.3	6.0	45.2	26.2	22.6
Rural	13.6	60.9	14.8	10.7	11.5	33.2	29.4	25.9

Source: Statistical abstracts (various)

<sup>7</sup>Mazera Ndurya, "Land problem at the Coast is being politicized by leaders," says Maitha, *Daily Nation*, Tuesday, 22 August 2006: 24.

increase over the 1996-2005/6 period, to about 0.83 of landholding in the entire population. The worsening was especially striking in the Coast and Nyanza provinces. Levels of inequality in the latter year are remarkably high not only in Nairobi but also in the Rift Valley and Coast provinces. The Nairobi figure is very high—perhaps partly reflecting the high rates of tenancy.

Putting the landholding results in regional and international perspective, Kenya's rates of land inequality were significantly higher than South and East Asia, for example, but close to sub-Saharan and North African averages (Figure 2.2). The more recent estimates for Kenya bring the country closer to levels similar to those observed in a region that is renowned for land inequality, Latin America.

There is also inequality in agricultural incomes, which varies across households, villages and agro-ecological zones. Annual crop incomes for households in 2004 were Ksh 15,281 and Ksh 99,319 for food poor and non-food poor in the Coastal lowlands, Ksh 36,503 and Ksh 97,939 in the central highlands, and Ksh 33,062 and Ksh 129,757 in the high potential maize zone respectively (Argwings-Kodhek, 2006).

The status of land and its management contribute to inequality in Kenya. The poor are the most vulnerable from degradation of land as they hardly invest in agricultural inputs such as fertilizers<sup>8</sup> and soil and water conservation measures (Kabubo-Mariara *et al.*, 2006). The results are lower crop output, lower incomes and increased food insecurity. On the

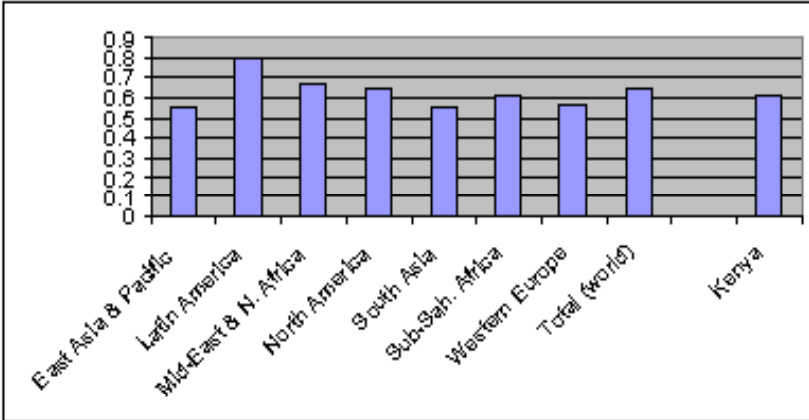
**Table 2.2: Changes in land inequality over time, all households, by province and nationally, Gini coefficient, 1996 -2005/2006**

	1997	2005/6	Percentage change
National	0.612	0.832	35.9
Nairobi	0.757	0.993	31.1
Central	0.546	0.744	36.4
Coast	0.500	0.865	73.1
Eastern	0.601	0.731	21.6
Nyanza	0.475	0.815	71.8
Rift Valley	0.642	0.870	35.4
Western	0.579	0.769	32.7

*Source: www.hackkenya.org. Accessed on 13 August 2009*

<sup>8</sup> However, in a study of agro forestry-based soil fertility replenishment (SFR) technologies in western Kenya, the poor adopted SFR strategies at the same rate as the non-poor (Place *et al.*, 2005).

**Figure 2.2: World average land inequality against Kenya's, 1986-1990**



Source: [www.hackkenya.org](http://www.hackkenya.org). Accessed on 13 August 2009

other hand, the rich are able to mitigate the negative impact by investing in higher levels of inputs and other forms of land improvements. Such differential impact of land degradation increases income inequality.

Poor pastoralists also suffer disproportionately from degraded rangelands and drought than the wealthier ones (McPeak and Barret, 2001). This differential exposure to risk sustains structural poverty traps from which many pastoralists are having difficulty in escaping. Land degradation also reduces economic growth. Costs of soil erosion at the national scale have been estimated to be equivalent to US\$ 390 million annually or 3.8 per cent of GDP (World Agro Forestry Centre, 2006). Both large-scale and smallholder farmers contribute to soil erosion. However, smallholder farmers are bigger contributors not just to soil erosion but also generally to land degradation problems.

Formalization of land rights has not always benefited the rural poor. Instead, the general tendency has been that the elite benefit from reforms while the majority of the poor and vulnerable end up worse off as institutions and systems that supported their livelihoods and gave them a sense of security are marginalized and replaced by modern institutions (Odhiambo, 2006). The consequence is increased inequality in access to land between the rich and the poor. The increasing population pressure in many parts of the country also tends to exacerbate the problem of inequality.

Inequality also leads to land degradation. Inequality of access to land has wrought many land conflicts. The land clashes in Njoro, Kuresoi and Mt Elgon are clear examples. Moreover, the post-election violence in the country (early 2008) has been attributed to inequalities in land ownership (Government of Kenya, 2008). The same applies for land

clashes witnessed in 1992 and 1997. Since there is no incentive to invest in land in such circumstances, the result is land degradation.

Inequality through distribution of access rights also causes land degradation (Wisner, 1987). The poor often migrate to marginal areas as they are forced to sell land to raise school fees and money for other needs. They also lose out both under customary and statutory laws regarding land ownership.<sup>9</sup> During formalization of rights, the poor often lose secondary rights such as access to harvest certain trees and paths through people's farms to water sources, firewood sources, school, health centres and shopping centres. The Ogiek of the Mau Forest and Mt. Elgon, the El-Molo of Marsabit District and the Malakote of Tana River District, all of who are hunter-gatherers, have been rendered landless as the government has gazetted some of their land (Indigenous Information Network, 2006; and KLA, 2002a).

Distribution of land contributes to gender inequality in the country. Women are disadvantaged as they do not inherit land. Despite providing the bulk of labour in agriculture, women only hold 1 per cent of registered land titles in their names and about 5-6 per cent of registered titles in joint names (KLA and FIDA-Kenya, 2006). They lack adequate provisions to hold land rights independently of their husbands or male relatives. Statutory law often does not provide for women's independent rights and when such legislation exists, mechanisms to enforce it are often absent. The use rights that women tended to have on land in traditional family structures may not grant enough security for them and other dependants when such structures dissolve.

Other factors that tend to perpetuate gender inequality in land ownership and access in Kenya include the tendency to leave women out during land distribution exercises to the landless or in the re-settlement schemes (KLA, 2002b) and to direct agricultural services and education to male farmers (KLA, 2002b). There are also structural barriers of access to land for women, such as access to credit and general lack of resources to purchase land (KLA, 2002a and 2006). Indeed, opposition to women ownership of land is so strong in the country that it counts among the factors that led to the rejection of the country's new constitution at the referendum in November 2005.

Women are also generally poor and, therefore, cannot afford soil conservation investments. In a study carried out in Machakos (Mwakubo, 2003), women were found to have lower terrace density per acre. They also had less land holdings compared to men. The causes of inequality in land include differential regional natural endowments (Figure 2.1),

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<sup>9</sup> The poor have lost out to more powerful farmers in innumerable local land tribunal cases accompanying the privatization process (Brokensha and Glazier 1973; and Okoth-ogendo, 1976).



historical reasons, corruption and weak governance, lack of a land policy, customs and traditional biases against women, and inadequate legal and regulatory framework (Box 2.1).

The origins of inequality are traced to colonial measures, notably those associated with land expropriation, the distinction between high and low potential land, and the attendant designation of some areas as labour reserves while favoured areas benefited from infrastructure investment and the provision of subsidized credit, extension and marketing services (SID *et al.*, 2006). Lack of policies implies *ad hoc* interventions and management, which leads to conflicts, over-exploitation (Mwanje *et al.*, 2003), and worse inequality over access and use.

Some laws are colonial relics and do not reflect present day reality. Not surprisingly, there is a serious conflict between the Maasai and private large-scale landowners over land agreements made at the beginning of the 19<sup>th</sup> century. The inequalities and possible use of force that may have characterized the signing of those agreements have never been rectified or resolved. The regulatory framework on land has led to conflicts, lengthy litigation and exclusion of access by certain sections of society (Odhiambo and Nyangito, 2003). Where the law is clear, its implementation is problematic due to corruption. As Odhiambo and

**Box 2.1: Access to land and inequality**

- a) The issue of land in Kenya has always been emotive (NEPAD, 2006). Incessant wrangles over land and natural resources by some communities are partly attributable to the unfair distribution of land. Most of the land in the country is in the hands of only 20% of the population. Due to the culture of political corruption and mismanagement, large tracts of land were allocated to politically connected individuals and leaders in the 1980s and 1990s, at the expense of the poor. A handful of prominent Kenyan families and a residual class of White settlers are among the biggest landowners in the country. Thus, a narrow ethnic and class monopoly over land has been consolidated. This has resulted in deterioration of land quality, squatting and landlessness, disinheritance of some groups and individuals, urban squalour and under-utilization and abandonment of agricultural land. Some potential conflict areas are the Maasai lands and those owned by ranchers as well as the residents of Coast Province, who still rue the loss of a 10-mile coastal strip.
- b) In Coast Province, rural landlessness is most prominent in Kwale, Kilifi, Taita Taveta and Malindi Districts, with the majority of the inhabitants being the Miji Kenda, Taita and Taveta communities (KLA, 2002c). The problems range from the unresolved Mazrui family land disputes in Kilifi to Tana River's perennial land adjudication mess that has culminated in fighting between the pastoralist Orma and the farming Pokomo community.
- c) In 1981 in Nakuru District, 91% of the owners held only 21% of the land while 5% of the owners controlled 79% of the land. The top 2% of the owners controlled 69% of the land (Njonjo, 1981).

Nyaliech (2005) argue, corruption is a significant problem in Kenya and is widely associated with increased inequality and the distortion of the state's redistribution role.

Corruption worsens poverty and inequality within societies (KNCHR and KLA, 2006; ACEG, 2001). Land and other natural resources occupy a central place in the livelihoods of the majority— corruption diverts these resources from the intended public use in the realization of rights to decent livelihoods into private bank accounts. Besides creating sudden and extreme income inequalities, the diversion of these kinds of resources causes massive human deprivations. Ultimately, it is the poor and the weak who face the costs of corruption (ACEG, 2001). Corruption also causes economic uncertainties that discourage investments that are critical for economic growth and poverty alleviation. Illegal and irregular allocations of public land are particularly harmful to the poor because the poor are more dependent on public goods and services they provide.

The draft national land policy should be finalized and implemented to address inequality associated with land and thus control land degradation. Suggested measures such as setting minimum and maximum size of land that one can own, land re-distribution,<sup>10</sup> taxation of idle land, equal access to land by women, and digitization of the land information system would greatly reduce inequalities and promote sustainable land use. This should go hand in hand with constitutional reforms to entrench the process and to harmonize the various land laws in the country. Equally important are clear rules and procedures for formalizing informal property rights. In addition, the Department of Lands should be strengthened and aligned to being pro-poor and gender sensitive in land allocations.

## **2.2 Water**

Kenya has five major 'water towers': Mt Kenya, Aberdare Ranges, Mau Complex, the Cherangani Hills and Mt Elgon (Figure 2.3). These water towers have given rise to five drainage basins, with the Tana River and the Lake Victoria basins being particularly critical to the country's socio-economic well-being.

There is also an imbalance in water abstraction rates across the country (Table 2.3). Although Lake Victoria has the highest water endowment in the country, it is the least abstracted, as only 2.2 per cent of its water is used. Kenya is a water-scarce country with renewable fresh water per capita at 647 m<sup>3</sup> against the United Nations recommended minimum of 1,000 m<sup>3</sup>. This compares unfavourably with the neighbouring countries

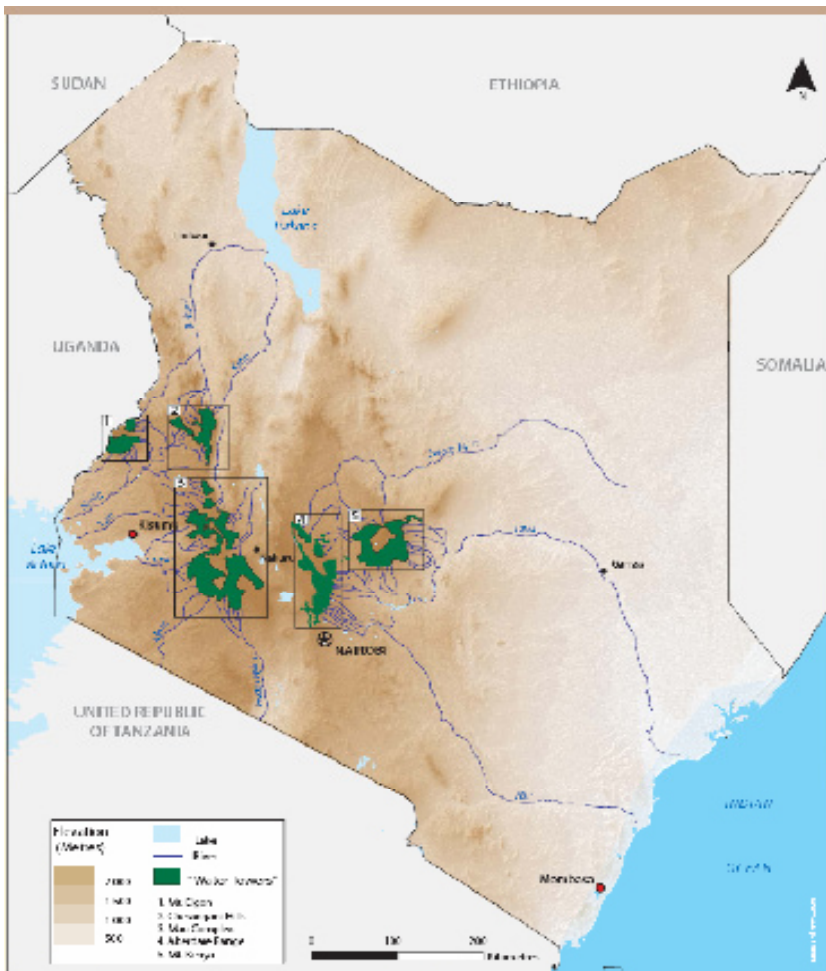
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<sup>10</sup> Politically unpalatable despite being more desirable because it directly enhances opportunities for, and capabilities of the poor (SID *et al.*, 2006). It is also hard to do except in exceptional circumstances, often involving political violence.

of Uganda and Tanzania, which have per capita levels of 2,940m<sup>3</sup> and 2,696m<sup>3</sup>, respectively (see Vision 2030). The water abstraction rate (percentage of all available water taken) in Kenya stands at 5.5 per cent. Of this, surface water constitutes 84.7 per cent, the rest being underground.

It is critical to note that Kenya's fresh water per capita has been declining and is projected to reach 235m<sup>3</sup> by 2025. This may not be attained unless effective measures to address the challenges are implemented as stipulated in Vision 2030. Currently, Kenya is among the top 10 per cent water-stressed countries in the world (Geller *et al.*, 2007).

**Figure 2.3: The five water towers of Kenya**



Source: UNEP (2009)

**Table 2.3: Water abstraction rates in different regions in Kenya**

Drainage	Volume (metre cubed/yr)	% of water abstracted	Water quality
Lake Victoria	11,672	2.2	Fresh water lake. Rivers exhibit variable seasonal water quality
Rift Valley	2,784	1.7	Only Lake Naivasha has fresh water. Agricultural pollutants and siltation affect water quality
Athi River	1,152	16.6	Water quality good in upper reaches but deteriorates downstream due to pollution
Tana River	3,744	15.9	Generally of good quality but deteriorates gradually downstream due to pollution
Ewaso Ng'iro	339	12.4	Rivers have high turbidity due to agricultural activities
Ground Water	600	9.1	
National total	20,291	5.5	

*Source: Ministry of Water and Irrigation*

There are low levels of investment in the water sector in Kenya, with most infrastructure being old and depilated (Were *et al.*, 2006). The country's water resources have been affected by unsustainable water and land use policies, growing pollution and degradation of rivers, lakes, wetlands and catchments.

There are considerable disparities with respect to access to water in the country. Regionally, Nairobi, Coast, Rift Valley and Central provinces have the highest proportions of households with piped water in their dwellings (Table 2.4). The same provinces have a greater percentage of the people having a water source within shorter distances. Although Western Province is home to some of the major water basins in the country, it has poor water accessibility.

According to the Kenya Integrated Household Budget Survey 2005/6 (KIHBS), access to water supply is poor with only about 57 per cent of households using water from sources considered safe. Water coverage has been estimated at 60 per cent in urban areas, dropping to 20 per cent in settlements of the poor where about half of the urban population lives. In the ASALs, the average access to safe water<sup>11</sup> in 2006 was estimated

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<sup>11</sup> Keynote address at the official launch of 2006 Global Human Development Report by Hon. John Mutua Katuku, Minister for Water and Irrigation held on Thursday 23rd November, 2006, at the Kenya Institute of Education.

**Table 2.4: Water indicators and resources in Kenya**

Province	% of households with piped water in dwelling	% of households with a water source less than 15 min. away	Water tower in the province
North Eastern	-	70.5	-
Coast	9.2	78.7	-
Central	7.6		Mt. Kenya
Nyanza	2.5	74.7	Lake Victoria basin
Eastern	3.7	54.8	Mt. Kenya
Rift Valley	8.5	67.7	Aberdares, Mau complex
Western	-	65.4	Cherenganyi, Mt. Elgon
Nairobi	28.1	97.6	-
Kenya	7.8	70.5	

*Source: Kenya Integrated Household Budget Survey, 2005/06*

at below 40 per cent, while in rural areas in general, sustainable access to safe water was estimated at about 40 per cent.

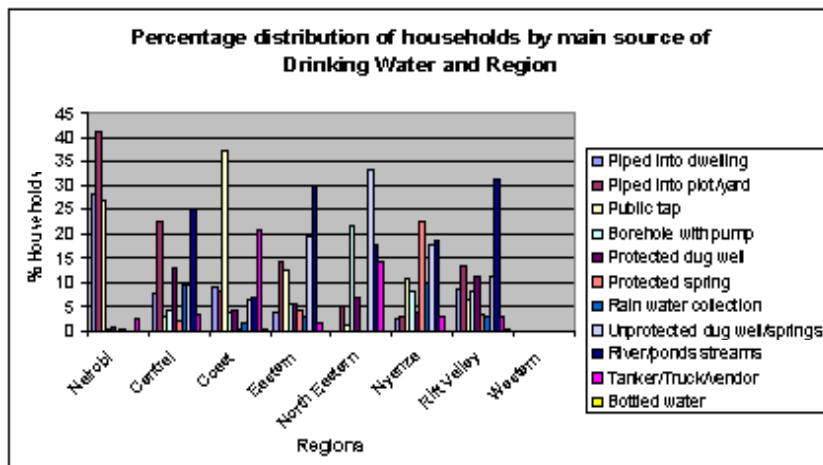
About 83 per cent of the population in urban areas and 46 per cent in rural areas had access to an improved water source in 2004 (World Bank 2007). This rose from 60 per cent in urban areas and 40 per cent in rural areas in 2000. About 24 per cent of Kenyans use unsafe water from streams, ponds, lakes and river sources.

As a source of water for households, public tap is dominant in Coast and Nairobi while river/streams are common in Rift Valley, Nyanza, Central and Eastern provinces (Figure 2.4). Boreholes with pump are dominant in North Eastern Province.

In most rural parts of the country, people obtain their drinking water from untreated surface and ground water. The dependence on surface water is most prevalent along permanent streams and other fresh water bodies (Figure 2.5). Households relying exclusively on surface water are the most vulnerable to flow interruptions and water contaminations as those with piped water can protect themselves from these impacts.

Although water pollution data is scanty, there was a marginal increase of water pollution levels from 0.23 (kg per worker) of organic pollutants in 1990 to 0.24 in 2003 (World Bank, 2007). This explains the acute problem of waterborne diseases in the country. In general,

**Figure 2.4: Percentage distribution of households by main source of drinking water and region**



Source: Kenya Integrated Household Budget Survey, 2005/06

water resources degradation costs the country at least Ksh 3.3 billion (0.5% GDP) annually.<sup>12</sup>

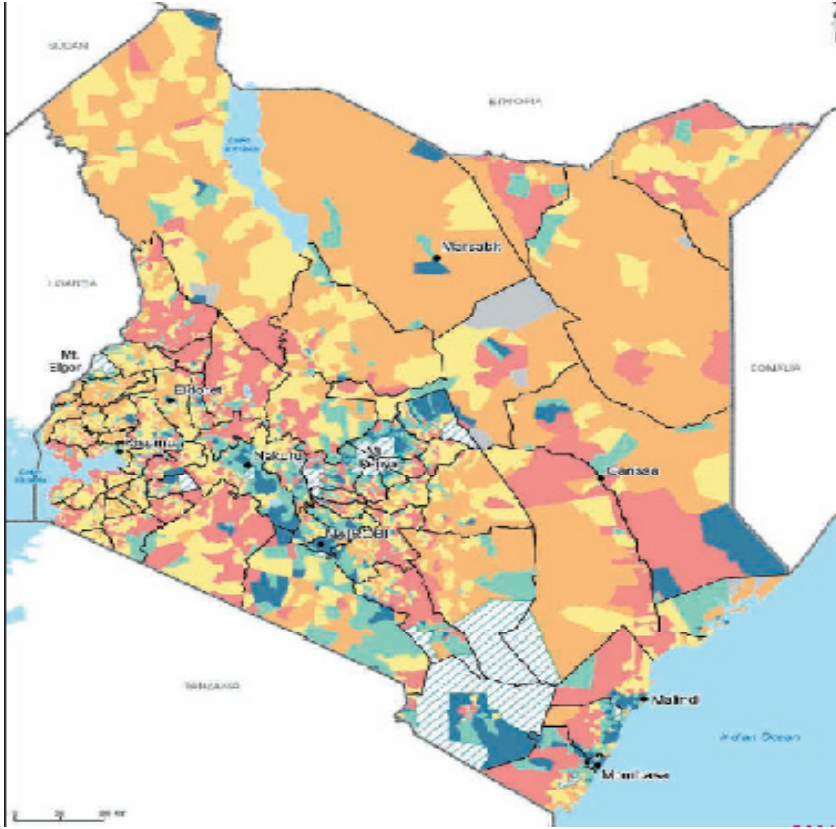
Generally, water resources are under pressure from agricultural chemicals and urban and industrial wastes, as well as from use for hydroelectric power in Kenya. The country expects shortage of water to pose a problem in the near future due to high population increase, wastage and under-investments in the sub-sector (IEA, 2007). Other problems include catchments degradation, hydrological variability and rapid population increase. Water quality problems in lakes, including water hyacinth infestation in Lake Victoria, have contributed to a substantial decline in fishing output and endangered fish species.

Inadequate access to improved water and sanitation is causing deaths and other illnesses. With an access rate of 61 per cent to improved water and 43 per cent to improved sanitation, Kenya had 21,800 deaths and 23 Dalys<sup>13</sup>/1000 capita per year in 2002 from diarrhoea (WHO, 2007). Approximately 60 per cent of Kenya’s hospital attendance is due to preventable diseases of which 50 per cent are related to sanitation, hygiene and water (IEA, 2007).

<sup>12</sup> <http://www.amazon.com/Climate-Variability-Water-Resources-Degradation/dp/0821365177>. Accessed on 16th April 2009.

<sup>13</sup> Disability adjusted life years (DALY). DALYs for a disease are the sum of the years of life lost due to premature mortality in the population and the years lost due to disability for incident cases of the health condition. The DALY is a health gap measure that extends the concept of potential years of life lost due to premature death to include equivalent years of ‘healthy’ life lost in states of less than full health, broadly termed disability. One DALY represents the loss of one year of equivalent full health.

**Figure 2.5: Ecosystem dependence**



Source: WRI et al., (2007)

There are remarkable differences among different income groups in the country in terms of access to safe drinking water. The richer segment of the population has comparatively better access to this basic commodity than the poor segments. Over 93 per cent of the richest 20 per cent have access to clean drinking water compared to only 28 per cent of the poorest 20 per cent (SID, 2004).

The status and management of water contribute to inequality in the country. The volume of water in permanent rivers like the Tana, Mara, Athi and Kerio has reduced significantly over the years, while a substantial number of streams particularly in ASALs have ceased to flow. Even in high-potential areas, streams that were previously permanent have become seasonal. Declining water volumes have also been witnessed on Lakes Turkana, Nakuru and more recently Lake Victoria. The level of water on Lake Victoria, for instance, dropped by 1.64 metres between 1998 and the end of 2004.

The poor suffer from water shortages and diseases, thereby increasing poverty. For instance, water provided to slums in Nairobi is reduced during periods of shortage to maintain flows to high-income areas (UNDP, 2006). About 52.3 per cent of the population in the Ewaso Ng'iro North river basin use water of questionable standards (UNCRD, 1999). Besides, the poor pay more for water than the rich (Box 2.2) thereby increasing inequality. Generally, the cost of water for the urban poor and rural poor (mainly in arid areas) is higher than those in formal settlements in urban areas and medium/high potential areas.<sup>14</sup>

Women also suffer disproportionately from scarcity and degradation of water resources. In many areas, women have the responsibility of fetching water especially for domestic purposes, yet they are also the key source of labour for agricultural production. The amount of time they spend collecting water, which is estimated at about 15 per cent, affects the amount of time they have for education and paid work. Whittington *et al.* (1990) estimated the value of time spent collecting water for households in Ukunda, Kenya, at nearly equal in value to the wage rate for unskilled labour. This means that ecosystem degradation that leads to drying of streams or pollution of available water bodies worsens gender inequality by reducing the time available for women to earn wages.

The reverse effects are also evident in the water sector; that is, inequality contributes to degradation of water resources in the country. Thus, the rich over-exploit and pollute water resources (Figure 2.6). Flower and horticultural companies, and even individual large-

**Box 2.2: The poor pay more for water than the rich**

A recent study<sup>15</sup> has found that the poor pay much more for clean water than the rich, yet they are receiving less of the commodity. Residents of Nairobi slums pay 5 to 10 times more for water than the rich. In Kibera, for instance, less than 40% of households have access to legal water connections. Of those that do, about a third receive water only once every two days. Kibera residents are forced to spend an average of more than two hours a day waiting for water at standpipes that function for 4-5 hours a day or less. About 80% of the residents buy all or some of their water from vendors. Prices average at Kshs 252 per cubic metre, but rise to almost double during the dry seasons. The average price is seven times higher than that paid by people in high income settlements served by the Nairobi Water and Sewerage Company, and higher than prices in London or New York.

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<sup>14</sup> Draft Infrastructure Sector Medium Term Plan 2008-2012.

<sup>15</sup> This is the 2006 Human Development Report, "Beyond Scarcity: Power, Poverty and the Global Water Crises".



**Figure 2.6: Flower firms, pastoralists and pollution**



scale farmers, illegally<sup>16</sup> and excessively pump water from rivers and underground reservoirs for irrigation with little regard for communities living downstream. In Naromoru catchment, for instance, about 80 per cent of the water is abstracted without permission during high flow and as much as 98 per cent during low flow (Makali and Kiteme, 2005). The resultant effect increases inequality, which may lead to social instability, cooperation failure and conflicts (Box 2.3).

Water-related conflicts have been experienced between the Oromo (pastoralists) and the Pokomo (agriculturists) in Tana River District, the Gabra and the Borana in Marsabit District (Olukoye, 2003), the Samburu pastoralists and farmers in Laikipia, the pastoralists and the flower farms in Lake Naivasha, and the small-scale farmers, pastoralists and horticultural firms in the Ewaso Nyiro River Basin (Makali and Kiteme, 2005).

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<sup>16</sup> The law allows for harvesting of floodwater from rivers for irrigation purposes as opposed to drawing of the reserve flow. To ensure sustenance of aquatic life, only water for domestic use should be drawn from the reserve base. During the rain season, farms can harvest as much water as they can, instead of letting it go to waste. It is estimated that more than 50% of water abstractions are illegal.

**Box 2.3: Water use conflicts in Kenya**

Scarcity of resources and inequality of access leads to conflicts. In pastoral areas, clashes over water are common; for example, in early 2005, 22 people were killed and more than a dozen injured in fighting over a water point in Ewaso Kedong. Some of the farmers had diverted the water to irrigate their farms, provoking the Maasai pastoralists<sup>17</sup> living downstream to destroy water pipes and other property in protest. Similarly, in July 2005, 56 people, including 22 primary school children, were killed at Turbi as the Borana and Garba pastoralists fought over access to grazing land and water. Twenty other people were killed in revenge attacks (called the Turbi massacre). There were also the Pokomo and Wardei fatal conflicts in July 2001 in the Tana River Delta. Conflicts over irrigation water are a growing threat in high-potential areas where farmers upstream abstract water leaving little for users downstream.

The failure to cooperate and water use conflicts eventually lead to degradation of water resources. Besides contributing to resource use conflicts, reduced access to resources directly contributes to increased poverty levels (Olukoye, 2003), which in turn lead to degradation of water resources.

Inequality in access to water resources in Kenya is attributable to several factors. Key among them is the differential regional natural endowments, poverty, political economy, tribalism, production and consumption externalities of the rich,<sup>18</sup> and inadequate legal and regulatory framework.

Before the Environmental Management and Coordination Act (EMCA) was enacted in 1999, an ordinary citizen did not have the right to sue (*locus standi*) with respect to environmental problems. It was only the Attorney General (AG) who could sue. Given the influence and importance of the political economy in Kenya, chances of the AG suing were rather small. There were (and still are) cases where the rich use water from rivers to irrigate their farms at the expense of other people downstream. Worse still, these farms end up discharging wastes to the nearby rivers that the poor rely upon for drinking water and other uses.

The water sector in Kenya is guided by the *Sessional Paper No. 1 of 1999 on National Policy on Water Resources Management and Development*. The precursor was the National Water Master Plan of 1974, whose primary aim was to ensure availability of portable water

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<sup>17</sup> Athman Amran, "Environmental Refugees Increase", *The Sunday Standard*, 5 November, 2006: 6.

<sup>18</sup> While democracy is supposed to promote markets, when participation is low, market failure often leads to elite capture, which they consequently manipulate to serve their interests (SID *et al.*, 2006).

at reasonable distance to all households by the year 2000. The legal framework for managing water resources in Kenya is the Water Act (2002), which was enacted to eliminate the inherent weaknesses in the previous Water Act Cap 372 (e.g. lack of standards, lack of recognition of communities in management, lack of centralized coordination of water uses among different sectors and weak management of water resources). The purpose of the reforms was to move the nexus of decision making to the community level.

Water ownership is still held by the state (not riparian interests), but communities determine what their water needs are and then petition the Water Resources Management Authority (WRMA) through the catchments offices to assist with the infrastructure development to meet those needs. Water service providers (WSPs), either public or private, act to deliver these services while the Water Services Regulatory Board (WSRB) ensures the regulations set by the state to protect the resources are maintained.

The National Water Services Strategy 2007, currently being implemented, has also been developed and focuses on increasing sustainable access to water from 60 per cent to 80 per cent in urban areas and from 40 per cent to 75 per cent in the rural areas. Despite the enactment of the Water Act (2002), inadequacies that tend to enhance inequality in access to water still exist. For instance, the Water Act mainly addresses the issues of water delivery, but fails to address the availability of water. As a result, there are regional disparities in the available quantities of water. In the ASAL areas, for instance, it is pointless to focus on water access when the commodity is not available in desirable quantities in the first place.

The reforms also tend to be skewed. For example, the WSRBs were designed along the major drainage basins. Thus, Western Province and Ewaso Ng'iro each have a board despite the fact that Ewaso Ng'iro covers over 70 per cent of the country. The boards also receive equal funding, which is not commensurate with the investment required to serve the people in their areas of jurisdiction.

The WSRB and the Water Services Trust Fund (WSTF) are not yet fully playing their regulatory and funding roles. It is not clear whether WSPs should be under the Companies Act or the State Corporations Act (Maalim, 2006). Full implementation of the Water Act (2002) is hampered by the fact that water abstraction fees are yet to be gazetted. As a result, excessive abstraction of water from rivers and reservoirs is continuing, thereby reducing access to the poor. In addition, the penalties are very low for those who misuse water resources (maximum fine of Ksh 2,000). There are also capacity limitations with the new institutions.

Other causes of inequality of access to water are corruption and lack of capacity by the WRMA, which is reflected in haphazard abstraction of water, pumping of water by flower firms at night to avoid detection, and low compliance with regulations. In addition, pro-poor orientation, which is a key ingredient to meeting the MDGs, is yet to be engrained among WSPs. The poor are still paying a high cost for water and often lack even the basic sanitation service.<sup>19</sup> Also, there is limited capacity development at the local level to manage water resources or even to participate in resource decision making. The other challenge is that given funding constraints, it appears that Kenya runs the risk of transferring fiscal shortcomings to rural areas where economic capacity is significantly lower than in urban areas (Marcus, 2006).

For efficient management of water resources, the full implementation of the Water Act (2002) is critical, coupled with addressing the shortcomings that have been cited. This should include full payment for water use<sup>20</sup> by all users, control of the on-going large-scale illegal water abstraction that is seriously hurting the poor, improvement of fiscal discipline in the management of water resources and breaking of water cartels. In addition, a water policy framework that is more integrated with other related sectors such as forestry, agriculture, energy, health, tourism, and the environment is crucial. The water service boards established in various parts of the country should be strengthened and their mandates clarified to remove overlaps with the roles and responsibilities of service providers. Related to this, WRMA should be adequately funded.

### **2.3 Forests**

Forests provide significant cultural and subsistence resources for the people of Kenya. It is estimated that 2.9 million people living within a radius of 5 km around forests derive direct benefits from indigenous closed forests (Wass, 1995).

Forests in Kenya cover a total area of 37.6 million hectares, of which 2.1 million hectares are woodlands, 24.8 million hectares are bush lands and 1.07 million hectares are wooded grassland. Although they cover about 2 per cent of Kenya's land area against a world benchmark of 10 per cent, currently forests contain 50 per cent of the nation's tree species, 40 per cent of the larger mammals and 30 per cent of the birds.

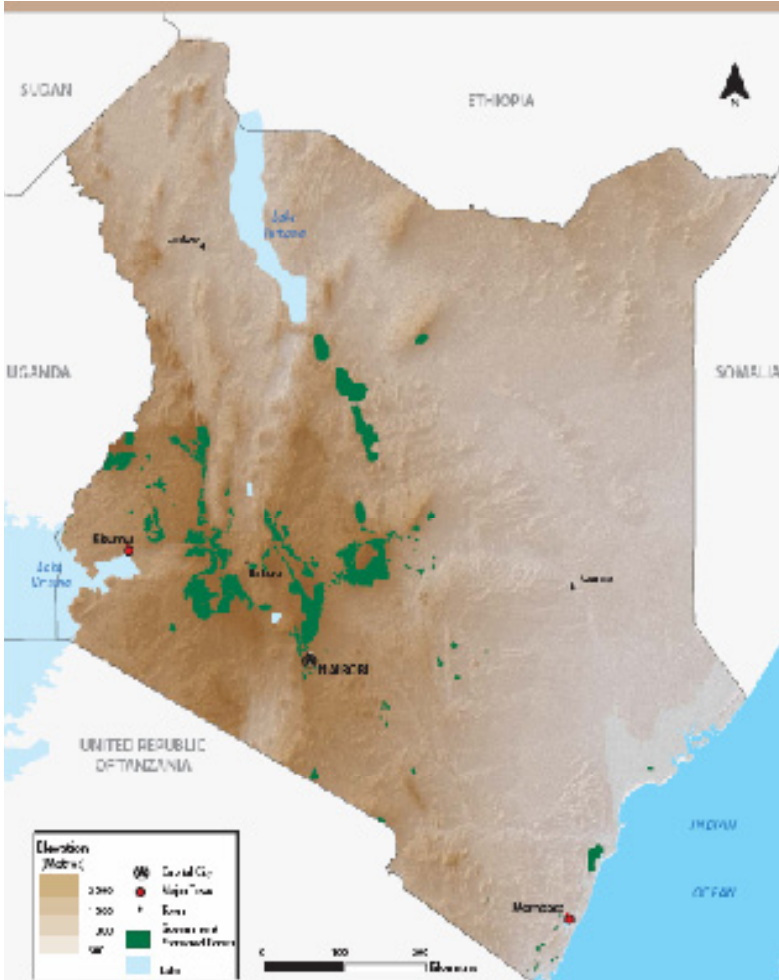
Most indigenous and exotic forests are found in the central highlands where rainfall is high, soils are fertile and human settlement is limited (Figure 2.7). In the ASALs, forests are found in isolated mountain ranges

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<sup>19</sup> "Water Sector Reforms: Five Years On". [http://www.wsp.org/UserFiles/file/Kisima\\_Newsletter\\_Issue\\_5.pdf](http://www.wsp.org/UserFiles/file/Kisima_Newsletter_Issue_5.pdf). Accessed on 17 April, 2009.

<sup>20</sup> There is no payment for abstracting water from a river or a reservoir for domestic use.

**Figure 2.7: Distribution of forests in Kenya**



Source: UNEP (2009)

and narrow bands along rivers. In as much as there is some forest cover in each of the provinces in Kenya, it is the Rift Valley and Central provinces that have commercially important forest plantations.

Most forests are managed as reserves by the Kenya Forest Service (KFS). Closed canopy forests in national parks and reserves are managed by the Kenya Wildlife Service (KWS), while the National Museums of Kenya (NMK) manage forests that are of cultural value. The local county councils (which have little or no requisite capacity) manage forests in trust lands.

In 1895, when Kenya was declared a British Protectorate, forestland was estimated at 30 per cent of total landmass (KNCHR and KLA, 2006). The country has since lost so much of the area under forests through official excisions and illegal logging (Box 2.4). The rate of deforestation has been estimated to be 931 km<sup>2</sup> or 0.5 per cent of the forest area per year (World Bank, 2007). Kenya's forested area<sup>21</sup> has been declining from 6.5 per cent in 1990 to 6.2 per cent in 2005 (World Bank, 2007). China, on the other hand, has been increasing its forested area from 16.8 per cent in 1990 to 21.2 per cent.

Both the rich and the poor have contributed to the destruction of forests, although most probably the poor have made a much smaller impact in relative terms. Degazettement of forest reserves and continuous widespread encroachment have led to the destruction of over 100,000 ha of forest since 2000 (UNEP, 2009). The consequences of deforestation are clearly manifest in Kenya. For example, the destruction of the Mau forest is endangering many of the rivers that flow from it such as the Mara River.<sup>22</sup> The River is the backbone of tourism at Maasai Mara, the world famous game reserve.<sup>23</sup> In addition, Rivers from the Mau also sustain Lake Nakuru, another key tourist attraction (Box 2.5).

Deforestation and poor management increase inequality in Kenya. Deforestation aggravates poverty as the poor depend on forest products to boost their incomes.<sup>24</sup> In addition, the poor are more vulnerable due to displacement and fuel wood reduction. The rural poor spend considerable

**Box 2.4: Official excisions, illegal logging and deforestation**

In 2001, 61,023 ha of forest in the Mau Complex were excised, including over half of Eastern Mau Forest Reserve. Eastern Mau Forest is the headwaters for the Njoro River, which drains its eastern slopes into Lake Nakuru. One quarter of South West Mau Forest Reserve was excised. The Southwest Mau Forest is the primary source of the Sondu River, site of the Sondu-Miriu hydro-power plant. All of Molo Forest Reserve was excised. Between 1973 and 2005, Maasai Mau Forest lost over 8,214 ha of forest within its official boundaries, which were established to protect the forest. Almost 43% of that loss occurred in just two years from 2003 to 2005. Just outside the gazetted boundaries of Maasai Mau Forest, nearly 32,000 ha were lost during the same period. In addition, people have encroached into some 43,700 ha of the Mau Complex's remaining protected forests.

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<sup>21</sup> Land under natural or planted stands of trees, whether productive or not.

<sup>22</sup> The other rivers include Njoro, Yala, Nyando, Sondu, Mara, Kero, Molo, Ewaso Nyiro, Nderit, Makalia and Naishi.

<sup>23</sup> Isaac Ongiri, "Tourism at the Mara Endangered". The Standard Newspapers 31 July, 2006.

<sup>24</sup> The nature and extent of dependence of the poor and non-poor on forests is likely to be different. The rich are likely to go for timber products while the poor go for non-timber forestry products. However, concrete evidence is not available.

**Box 2.5: Consequences of deforestation<sup>25</sup>**

Lake Nakuru, the home of nearly one million flamingos, is drying up and the flamingos are fleeing. Over 800,000 flamingos have fled while the remaining flock of about 300,000 could leave in a matter of weeks. Because of the destruction of the Mau forest, several streams and rivers that used to supply the Rift Valley lakes, and others which water the Maasai Mara and flow southwards into neighbouring Tanzania, have been reduced to a mere trickle, setting the stage for a major ecological disaster.

The only source of water for Lake Nakuru is Baharini springs. Its supply, however, is too little to support the flamingo population that rises to about 1.4 million birds when food is abundant. These springs are also threatened by intensive farming in Bahati Division. River Njoro, the most reliable source of water for the lake, now supplies water for only two weeks during the long rains in April. The little water that was flowing to the lake was cut off by quarries at Barut farm. Attempts by the provincial administration to ban sand harvesting in the area have been largely unsuccessful. Boulders rolling from the quarries end up in the valley below, cutting off the stream's flow. The river could also be losing its flow due to earth fishers and irrigation.

time collecting firewood, as deforestation increases the distance travelled to get it (Wisner, 1987). Fuel wood shortages may also induce households to substitute its use with inferior biomass fuels, which lead to increased air pollution and increased cooking time.

Damage to health associated with the use of traditional fuels has important gender and long-term implications, with women and young children being the most affected due to their predominant role in the collection and combustion of traditional fuels. There is increase in gender inequality with deforestation, as women have to walk longer distances to look for firewood (Hosier, 1982; Barnes *et al.*, 1984).

There have been many instances where the government has evicted people from forest lands. The state is 'ruthless and fast' during forest evictions, especially when dealing with the poor (KLA, 2002c). Further, the government only seems to evict the poor from the forests, leaving areas illegally acquired by the rich intact in the same forests. Inequality increases also as the rich have a greater capacity to exploit forests. There is also evidence of the reverse relationship. Thus, inequality leads to deforestation through social instability that encourages wanton destruction of forests (e.g., in Mt Elgon and Likia in Njoro), failure to cooperate to control access, and unequal distribution of access rights.

Illegal cultivation within indigenous forests has also reduced the forest cover in the country, as has the popular Non-Residential Cultivation or *shamba system*. The overall impact of the innovative and pro-poor *shamba system* has been reduced forest cover, largely because of weak

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<sup>25</sup> Michael Njuguna, "A Great Lake on its Death Bed," Daily Nation, 10 November, 2006: 1 & 11.

governance and poor implementation with the forest officers failing to adhere to the set guidelines (Box 2.6).

Gender inequality also causes deforestation as women rarely participate in crafting rules regarding forest management and in the planning process despite their thorough knowledge of the forest resource brought about by their high dependence on the forest for products.<sup>26</sup> Therefore, women may be more attentive to the ecosystem as a whole (Rocheleau *et al.*, 1996) and have more experience in its utilization. Decision-making regarding the ecosystem should, therefore, take into account the women's knowledge base and experiences.

The causes of inequality in access to forests are natural endowment (Figure 2.7), poor governance, corruption, production and consumption externalities of the rich, poverty, political economy, and inadequate legal, regulatory and policy frameworks. Land under forests belongs to all Kenyans and when it is corruptly allocated to a privileged few, it further enhances inequality. The allocations are often in the pretext of giving land to the landless people. The illegal and irregular allocations of public land for Karura, Ngong and Kiptagat forests, for example, are estimated to have transferred in excess of Ksh 18.4 billion to the rich<sup>27</sup> (KNCHR and KLA, 2006).

In some cases, forest areas were deliberately left out of titling. The belated issuance of selective title deeds to Karura and Ngong forests, for example, deliberately excluded a total area of 1,125.5 ha from titled

**Box 2.6: Shamba system and weak governance<sup>28</sup>**

Most forest plantations in Kenya are established through Non-Residential Cultivation (NRC) "Shamba System". Under this system, farmers are given pieces of clear felled plantation forest areas to cultivate while taking care of planted tree seedlings. The farmers are allowed to occupy the plots until canopy closes or for a maximum of three years, whichever comes first.

The system has been 'commercialised' whereby plots are in most cases sold to prospective cultivators. This has led to the current abuse of the system with forest officers either colluding, or taking advantage of the system or failing to adhere to the set NRC guidelines. Cultivators have also resorted to tampering with the trees in an effort to stay longer to recover the money given to the sellers. The farmers wilfully destroy tree seedlings to extend tenancy. Farmers are also known to extend their farm land into the forest, some by about 30 metres.

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<sup>26</sup> E. Obonyo, J. Mogoi, V. Oeba and P. Ongugo, "Exclusion, Poverty and Inequality in Decentralized Kenyan Forests: Bridging the Divide", [http://dlc.dlib.indiana.edu/archive/00003960/01/Obonyo\\_220601.pdf](http://dlc.dlib.indiana.edu/archive/00003960/01/Obonyo_220601.pdf). Accessed on 17th April 2009.

<sup>27</sup> These are often politicians, high-ranking government officials and businessmen.

<sup>28</sup> Michael Gachanja, "Forest Law Enforcement and Governance: The Case of Kenya", Paper prepared for the Regional Workshop on the African Forest Law Enforcement and Governance (AFLEG) process, 24<sup>th</sup>-25<sup>th</sup> February 2003, Nairobi, Kenya.



areas. The areas left out were then illegally and irregularly allocated to “private developers” (KNCHR and KLA, 2006).

In 1997, the government decided to establish a settlement scheme in the Nakuru/Olenguruone/Kiptagich extension forest area to resettle the Ogiek, one of the country’s very few remaining forest-dwelling communities. However, despite this noble intention, the beneficiaries were largely the rich. Only a small number of Ogieks received any land.

Corruption is also rampant and is manifested in the provision of licences to companies to access forest plantations, produce charcoal in forest reserves, and transport the charcoal. There are cases where harvested forest land is sold to individuals and the funds pocketed by foresters (Gachanja, 2003). Apart from leading to deforestation, it further enhances inequality as the poor lose the benefits of the forest land.

Poor and inadequate policies are also partly responsible for inequality and the resulting problems of deforestation. The Kenya Forestry Service (KFS) faces a number of difficulties in securing its institutional future; for example, the proposed Forest Policy has not yet been approved by Parliament, knowledge of the 2005 Forest Act remains poor, and the necessary subsidiary legislation and national standards are not yet in place. Low penalties for offences, for instance, compared to the value of resources in question have led to destruction of forests with impunity. The rich find it easy to pay the penalties and thus extract more forest resources than would otherwise be possible, further enhancing inequality. There has been a systematic and periodic excision of forests that have occurred during election years such as in 1992, 1997, 2002 and the 2005 referendum. Most of these have been driven by the need to buy political support in the country, which has tended to benefit the rich.

Lack of harmonized policies in the Eastern Africa region has also played a major role in enhancing inequality and deforestation. Corruption at borders has allowed illegal trading of forest products. In Kenya, harvesting and exportation of mangroves is banned by a presidential decree, yet mangrove poles continue to be exported to Saudi Arabia (Gachanja, 2003). Charcoal from Kitobo Forest in Taita Taveta District is sold illegally in Tanzania. Illegally harvested hardwood, mainly *mvule* and mahogany from the Democratic Republic of Congo (DRC) finds its way to Kenya. Some of it is even exported from Mombasa to other countries. Ebony, a threatened hardwood in Tanzania, is sold illegally in Kenya. All these examples are indications of lack of harmony in policies, which are often exploited by the rich thereby increasing inequality.

Current land tenure laws have tended to favour large commercial entities over local communities, especially in the issuance of concessions and licences with respect to harvesting of forest products. Forests are protected under the Forests Act (Cap 385). To allocate protected forested

areas, the law requires that it be de-gazetted for public interest purposes only. Even after such actions have been taken, the provisions of the Land Act and other planning and environmental legislation have to be strictly followed. However, in most cases, the procedures are not followed. Most excisions are done without technical considerations of social, economic and ecological implications. In a number of cases, boundary plans were not prepared, while in others, gazette and/or legal notices were not issued.

Some excisions went on even after the enactment of Environmental Management and Coordination Act of 1999, which subjects any major changes in land use to an Environmental Impact Assessment (EIA). Objections made by the public within the stipulated 28 days as required by the Forest Act are often not taken into account (Gachanja, 2003). The Act also does not set the procedures for objections.

Most of the laws that affect the forest sector fail to address livelihood pressure, access rights to communities and alternative sources of livelihood. Local communities have, therefore, viewed forests as government land and have for a long time been exploiting them for short-term gains (Gachanja, 2003).

The Kenya Forestry Master Plan (KFMP) of 1994 calls for an institutional overhaul to manage forest resources more effectively. It is expected that as soon as the new Forest Act of 2005 is fully operationalized, the management of forests in the country will improve considerably. The Forest Act of 2005 has a clear framework for participatory forest management and local communities user rights. It also has clear provisions for the management of all catchment areas with linkages to agriculture and water resources and for conservation and management of indigenous forests.

Whereas the previous Act (Cap 385) allowed the minister to de-gazette forest reserves without wide consultation, the new Act requires an environmental impact assessment, public consultation and parliamentary approval before any de-gazettement is done. In addition, unlike in the past where there was no provision for farm forestry, the new Act seeks to promote commercial tree growing by the private sector, farmers and communities by giving them incentives. However, successful implementation of the Forest Act requires proper enforcement, sustained political will and capacity among stakeholders to monitor, analyze and follow up. Moreover, the Ministry of Environment and Natural Resources under which the Kenya Forest Service (KFS)<sup>29</sup> falls, should be re-organized to ensure harmonization and effective coordination (Olukoye, 2006).

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<sup>29</sup> The Kenya Forest Service (KFS) was established on 1 February, 2007. KFS is now under the Ministry of Forestry.

The country plans to increase forest cover from less than three per cent of its land base at present to four per cent by 2012 and to lessen by half all environment-related diseases by the same time (Government of Kenya, 2008).

## 2.4 Wildlife

Kenya has diverse and abundant wildlife resources located not only in national parks, game reserves and other protected areas (Figure 2.8), but also in surrounding private and communal land. Protected areas cover close to 44,564 km<sup>2</sup> or 7.5 per cent of the country's total land area. The two Tsavo National Parks form 48 per cent of the total protected wildlife conservation areas. However, according to World Bank (2007), Kenya had about 12.6 per cent of the land area under protection,<sup>30</sup> with 0.5 per cent of marine protected areas by 2004. In spite of the large size of land under protected areas, about 70 per cent of the wild animals live outside the protected areas and are the main source of serious human-wildlife conflict in the country.

The status of wildlife and its management affect inequality in Kenya. Human-wildlife conflict (Box 2.7) is a major problem in the country. This conflict is intense in areas where croplands border national parks, such as in Imenti, Nyeri, Trans Mara, Kwale, Kimana, Leroghi and Taita Taveta.

The poor are the most affected through injuries, deaths and crop damage. Moreover, compensation from injury and death is small, besides the long delays in getting it (Obunde *et al.*, 2005). In a number of areas, local communities remain squatters following evictions to create national parks and reserves. Most recent cases include those of residents of Barwessa, who are now squatters in Kamnarock National Reserve, and residents of Kyulu who are squatters living in Kibwezi with no alternative livelihoods or proper shelter. While the poor suffer the blunt of wildlife damage, it is the rich who receive the lion's share of the tourism benefits.

Human-wildlife conflicts have been on an upward trend in Taita Division of Taita Taveta District since 1995, with the rate being higher near farms and water sources (Kamande, 2006). The conflicts range from crop destruction, which accounted for 83.6 per cent, livestock death (18.9%), human injury (20.3%), and human death (5.7%) (Kamande, 2006).

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<sup>30</sup> These are total or partially protected areas of at least 1,000 ha that are designed as scientific reserves with limited public access, national parks, natural monuments, nature reserves or wildlife sanctuaries, and protected landscapes. Marine areas, unclassified areas, littoral (intertidal) areas and sites protected under local or provincial law are not included.

**Box 2.7: Human wildlife conflict**

A report<sup>31</sup> released by ActionAid Kenya, “Wildlife Conservation Issues in Kenya,” argues that communities outside parks have been impoverished by diminished incomes owing to wildlife destruction. The report, based on extensive interviews in Samburu, Laikipia, Mt Kenya, Isiolo, Garissa, Narok, Kajiado, Taita Taveta, Kwale and Baringo, reveals a 25% loss in income for the communities. At least 100 people were killed by wildlife in these districts in 2004. At least one in two respondents lost up to Ksh 96,000 due to wildlife destruction of property and life.

Only in isolated cases—Mwaluganje Elephant Sanctuary in Kwale and Lewa Downs in Laikipia—do the people benefit. Almost 95% of communities in dispersal areas have suffered destruction by wildlife, according to the report. The costs of conservation are borne by the local people while benefits are dispersed nationally and globally. The local communities who host wildlife on their property or live in the neighbourhood of the protected areas, and bear the burden of negative externalities caused by wildlife, hardly access tourist revenue. There has been disparity in benefit sharing among the landowners and local communities within several eco-regions in the country.

In a similar study (Mwakima, 2005), 73 per cent of the respondents on Il Ngwesi communal ranch reported having had fatal encounters with wildlife, often resulting in the loss of livestock, crops or even injury or death of humans. The remaining 27 per cent of the respondents reported having had mild encounters, which resulted in injury of humans and their domestic animals. Crop damage was identified as the most frequent encounter between humans and wildlife (44% in Sweetwaters game sanctuary and 33% in Il Ngwesi communal ranch). The incidences of conflicts are also higher during the dry season, just before harvest (Kamande, 2006). These conflicts are mainly attributed to increase in human population, which has resulted in increased settlement on wildlife dispersal and migratory corridors. Majority of people in the human-wildlife conflict areas are subsistence farmers whose income is derived from the land. This makes them prone to poverty as they incur heavy losses year after year as a result of human-wildlife conflicts. Indeed, Kamande (2006) observes that 43.2 per cent of the respondents attributed their decrease in income to increased human wildlife conflicts while 53.7 per cent attributed it to rainfall unreliability.

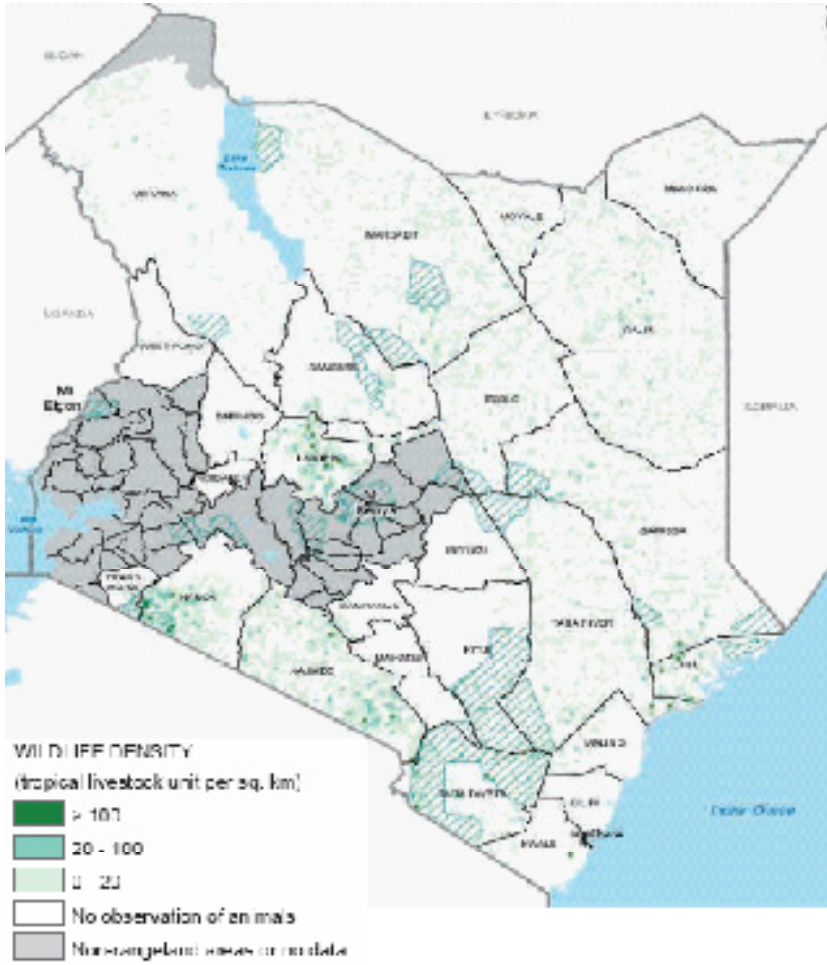
Some of the rich have private ranches and have greater potential to exploit wildlife for private gains thereby increasing inequality. The Soysambu Ranch in Nakuru District owned by the Lord Delamere family, for example, recently introduced balloon safaris where visitors fly over the ranch and Lake Nakuru National Park to view animals.<sup>32</sup>

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<sup>31</sup> ActionAid, “Wildlife Conservation Issues in Kenya”, Report of Action Aid International, Nairobi, Kenya, 2006.

<sup>32</sup> Dauti Kahura, “Lake Nakuru on the Verge of Extinction, Says Experts”, *The Standard*, 11 September, 2006: 10.

**Figure 2.8: Wildlife density**



Source: WRI *et al.* (2007)

Inequality in the distribution of resource rights leads to illegal hunting and poaching. The population of all non-migratory wildlife species in Maasai Mara ecosystem has declined by 58 per cent in the last 20 years (Ottichilo *et al.*, 2000). It is well known that unequal distribution of economic benefits accruing from wildlife discourages the communities from participating in wildlife conservation; they may either assume a passive role or engage in certain activities that are detrimental to wildlife conservation (Wandaka, 2006).

It is estimated that communities living in the dispersal areas that support the bulk of the country's wildlife receive less than 5 per cent of the estimated Ksh 21 billion earned annually by wildlife-based tourism (ECOWEB, 2006).<sup>33</sup> Furthermore, even the distribution of benefits within

group ranches in the wildlife areas is skewed in favour of the well-off and influential members (ActionAid, 2006).

Since all wildlife belongs to the state, there is no incentive to conserve the resources. Even private land owners who keep wildlife are not permitted to engage in hunting. This is perhaps the most contentious issue in the ongoing debate on the wildlife policy. Human encroachment (Obunde *et al.*, 2005) is contributing considerably to the destruction of wildlife habitats and game parks. A well-known example is the world-famous Maasai Mara game reserve, which is congested with structures (Box 2.8). Such encroachment is symptomatic of the governance problems in the country and how such problems are contributing to inequalities.

Moreover, land tenure system in the areas surrounding wildlife is largely untitled (Action aid, 2006), which is a further disincentive to land conservation. The causes of inequality in access to wildlife resources include inadequate policies, historical reasons (colonialism), poverty, weak governance and lack of capacity by relevant institutions.

Poor and inadequate wildlife policies contribute to human-wildlife conflicts and the resulting inequality. The wildlife sector has been managed for the last 31 years on *Sessional Paper No. 5 of 1975*, which is outdated. The paper did not anticipate human-wildlife conflict and therefore failed to make provisions for resource sharing. The operative law is the Wildlife Conservation and Management Act (WCMA), Cap 376 of 1977 (Revised in 1985), which also needs review. There is also no clear policy framework under which county councils, sanctuaries, conservancies, group ranches and private ranches operate with regards to wildlife (Action aid, 2006). Where laws exist to clarify property rights over resources, weak enforcement coupled with corruption and

**Box 2.8: Congestion of the Maasai Mara dispersal areas**

Over the last 15 years, there has been haphazard development of lodges, camps and trading centres outside the Maasai Mara game reserve. Land owned by group ranches in wildlife dispersal areas has been leased out to private companies and individuals, as a result of which more than 60 lodges and camps have been developed without impact assessment, exerting pressure on the fragile ecosystem. There is also serious water pollution on the Mara River.<sup>34</sup> Rampant charcoal burning and illegal logging near the Maasai Mara game reserve is being associated with the reduced water levels of rivers in the area. This threatens the survival of the game reserve.<sup>35</sup> The government has been forced to freeze development of tourist facilities in the Maasai Mara game reserve until a long-term management plan for the ecosystem has been formulated.

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<sup>33</sup> ECOWEB (2006). <http://www.propoortourism-kenya.org/ecoweb.htm>

<sup>34</sup> Ministry of Tourism and Wildlife, 2006.

<sup>35</sup> Isaac Ongiri, "Wildbeest Migration Could Be No More as Mara Rivers Dry Up," *The Saturday Standard*, 19 May, 2007: 23.

poor governance (Box 2.9) has led to poor outcomes, including wildlife poaching and inequality.

While it is illegal to kill wildlife, compensation for agricultural crop destruction and other costs is low, uncertain and difficult to obtain. Although considerable effort has been made to ensure that local communities surrounding national parks and game reserves share in tourism benefits, the poor people in these areas bear the bulk of the cost

**Box 2.9: Weak governance<sup>36</sup>**

Following an appeal by the Narok County Council and Kenya Tourism Federation, the National Environmental Tribunal barred a company (Wasafiri Camp Ltd) from building a lodge at a breeding ground for leopards in the Maasai Mara. The appeal sought to challenge an Environmental Impact Assessment (EIA) certificate of approval given by NEMA to the developer, contending that it was issued contrary to EIA regulations. It is claimed that Wasafiri developed the land before applying and getting presidential exemption from the relevant provisions of the Land Control Act. In addition, the development was done without a certificate of compliance and approval from the Director of Physical Planning as per Physical Planning Act. The company was also accused of drilling a borehole without the authority from the Water Resources Management Authority.

**Box 2.10: Wildlife resources and inequality**

The gazetted Mara Game Reserve<sup>37</sup> is 750 km<sup>2</sup>. Outer Mara, which falls under group ranches/conservancy, is about 800 km<sup>2</sup> although it used to be much larger. In the 1990s, the area along the Mara River and around the Mara Safari Club was all animal kingdom, but this has been replaced by maize fields. Currently, the Lemek area has been lost to wheat farming. Some group ranches adjacent to the Maasai Mara are being sub-divided and allocated to ranch members. Group ranches such as Koiyaki and Olkinyei have title deeds or are in the process of getting them.

To sustain the Maasai Game Reserve, tourism must continue to make economic sense to individual landowners. Otherwise the freeze on development of tourism projects such as camps and lodges does not stop Maasai landowners from growing maize or wheat if the returns from their investment in tourism are too low.

The Maasai Mara Game Reserve has an annual revenue of Kshs 500 million while the Amboseli receives Ksh 270 million, yet the money hardly trickles<sup>38</sup> down to the households. Instead it goes to the government (as taxes and gate fees) and multinationals running tourist resorts. Unscrupulous officials pocket the little that go to county councils. KWS allocates a paltry Ksh 32 million in community projects per year.

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<sup>36</sup> Nyakundi Nyamboga, "Tribunal Bars Company from Building Lodge in Maasai Mara," *The Standard*, 8 January, 2007: 16.

<sup>37</sup> Duncan Muriuki, "How to Sustain the Mara: Seventh Wonder of the World," *The Standard*, 9 January, 2007: 13.

<sup>38</sup> Ken Opala, "The Silent Revolt in the Wildlife Sector: Communities Host Wildlife But Bear the Burden of its Destruction and Hardly Benefit From the Wildlife Sector." *The Saturday Standard*, 21 October, 2006: 16.

of maintaining wildlife while the benefits largely accrue to big tourism businesses (Box 2.10).

Economic benefits accruing from wildlife are unequally distributed, with community benefits typically accounting for only a small proportion of the total value of wildlife (Emerton, 1998). In fact, other studies (Douglas-Hamilton, 1989; Waithaka, 2004) have estimated community benefits from Maasai Mara to be less than 1 per cent of the total revenue. In addition, the community around Amboseli National Park received only 1 per cent of the revenues from the park in 1990 (Norton-Griffiths *et al.*, 1995).

It should be noted, however, that the government collects taxes from these businesses and is now allocating greater budgetary resources towards infrastructure such as roads and rural electrification, education, health and other re-distributive and pro-poor programmes (Mwakima, 2005; and Wandaka, 2006). Moreover, some ongoing programmes such as the Kitengela Lease Programme (Obunde *et al.*, 2005), through which land owners whose land lies on the migration routes and dispersal areas are paid some money for not fencing their lands, are laudable. The Mwaluganje Animal Sanctuary in Kwale District, where landowners next to Shimba Hills National Park forego farming in order to accommodate wild animals on their land for a share of tourism earnings proportional to the size of their land is another innovative example.

To address inequality arising from human-wildlife conflict, it is imperative that the government settles people who have been displaced by parks/reserves and compensates communities for loss of land. It is also important to provide compatible alternative livelihoods for affected communities, increase compensation for losses arising from conflicts with wildlife and equitably share earnings from economic activities that are based on wildlife. Moreover, people with land holdings along wildlife corridors should get adequate compensation at current market rates to leave their land fallow for free movement of wildlife.<sup>39</sup> Where there is congestion with particular wild animals, the option to move them to other protected areas should be considered. The Kenya Wildlife Service in 2006 moved elephants<sup>40</sup> from the Shimba Hills Game Reserve to the Tsavo National Park in a bid to reduce human-wildlife conflict.

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<sup>39</sup> On a limited scale, there is Kitengela wildlife conservation lease programme, which is being run by a local conservation NGO (Reid *et al.*, 2006). Participants in this programme received Ksh 300/acre/year (US\$ 3.75 in 2005) and in return agree to allow free movement of wildlife on their land, refrain from poaching, report poaching by others, and avoid fencing or sub-division of their land. However, the initiative is yet to receive substantial funding from donors and the government.

<sup>40</sup> "Elephants to Be Moved to the Tsavo", *Daily Nation*, 25 August, 2006.



Community education is also crucial so that local communities learn to appreciate the value of wildlife. It is useful to also consider legislative amendments on ownership of wildlife to encourage conservation. There is opportunity for this in the ongoing review of wildlife policy. A comprehensive and coherent land use policy that is well integrated with other related sectoral policies such as wildlife is urgently needed.

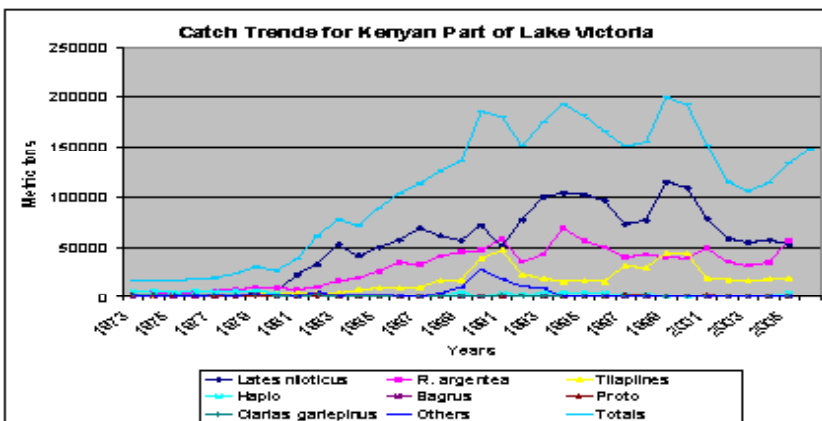
## 2.5 Fisheries

Most of Kenya’s fisheries are located in the Coast and Nyanza Provinces. Lake Victoria, which is located in Nyanza Province, accounts for about 98 per cent of all fish landings from inland fisheries and 93 per cent of total fish landings in the country. The entire potential for marine fisheries and crustaceans is located in the Coast Province. There are thus very few areas where fishing is a substantial source of income.

Figure 2.9 shows the catch trends for different types of fish species and the overall total for the Kenyan part of Lake Victoria. As the figure shows, there has been a general decline of fish catch since 2000. This could be because over-fishing, implying that stringent measures should be taken to arrest the situation.

Nevertheless, the status of fisheries and its management contribute to inequality in the country. Poor fishermen are vulnerable to over-fishing as it leads to lower catches and incomes (Bokea and Ikiara, 2000). This results in increasing poverty, which in turn leads to further over-fishing and use of destructive fishing technologies such as fish poisoning. Over-fishing also leads to low growth of the sector, which increases inequality, as the poor are more affected than the relatively richer people.

**Figure 2.9: Catch trends for the Kenyan part of Lake Victoria, 1973-2005**



Source: Data from Kenya Marine and Fisheries Institute (2007)

The commercialization of Nile Perch and other fisheries continues to edge out small-scale operators and women, thereby increasing inequality (Bokea and Ikiara, 2000; Abila, 2000). The loss of control over the means of production as well as processing, pricing and marketing by local fishermen to larger operators is a major inequality issue. There is diminished access to fish resources by the poor due to investment by the rich in expensive modern fishing technologies such as trawling and beach seining. The impact can be particularly perverse for artisanal fishermen that cannot afford mechanized boats and, at the same time, face a decline in productivity because of over-fishing.

In pricing, local fishermen have no say because of lack of storage facilities. In the processing and marketing sectors, large actors with a lot of capital have edged out poor traditional sellers and processors.

Inequality as a result of cooperation failure has led to the decline of many fisheries. The daily decision to fish, which leads to over-fishing, is influenced by pecuniary emulation and open access nature of fishery (Ikiara, 1999). Fishing on Lake Victoria, for instance, has been characterized by vicious conflicts among fishermen, fish processors and fishmongers. These conflicts have been over fishing grounds, catch and gear, among others. This resulted in uncontrolled and rapidly increasing fishing, the resurgence of water hyacinth and the general degradation of the lake's environment. Industrial waste flowing into rivers is also adversely affecting different fish species.<sup>41</sup>

The employment situation changed substantially when large-scale processing and fishmeal industries and trading agents gradually edged out the women who traditionally dominated the processing and marketing sectors. It has also been noted that due to increasing unavailability of fish for small-scale processing by women, non-price factors, in particular offering sex services to fishermen, determine access (Box 2.11).

**Box 2.11: Gender inequality in fishing<sup>42</sup>**

Because of the scarcity of fish, hundreds of women who live in makeshift houses along the beaches of Lake Victoria compete fiercely for fish, exposing themselves to HIV/AIDS. Since there are many artisanal traders against dwindling catch, some women are forced to offer sex as an added incentive to get fish from the fishermen. It is no longer simply a buyer-seller relationship; it has become "sex-for-fish" business, otherwise known as '*jaboya*' in the local Luo language.

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<sup>41</sup> Pollution threatens fish stocks, *Daily Nation*, Wednesday 29 November 2006.

<sup>42</sup> Personal interviews with local artisanal fish traders along the Lake Victoria beaches.

The causes of inequality in access to fisheries are: poverty, weak governance (Box 2.11), production and consumption externalities of the rich, differential access to technology and information, lack of capacity by the Fisheries Department, and lack of policy in the sector. Social taboos have also been responsible for gender inequality with regards to fishing in Lake Victoria. In the Luo community, women are not allowed to own fishing vessels and are also discouraged from fishing.

The Fisheries Department has developed a fisheries policy. Once it is fully implemented, sustainable use of fisheries resources is likely to be achieved. The Department is putting in place adaptive mechanisms to promote commercially viable aquaculture for both domestic and export markets. In addition, 300 beach management units (BMUs) are being trained on management and conservation of fishery resources in Lake Victoria.<sup>43</sup>

## 2.6 Other Resources

The other resources such as energy, wetlands, grazing pasture and pastoralism, minerals and biodiversity also have a relationship with inequality in the country. However, this study has not been able to discuss them in detail because of lack of adequate data. They are nevertheless briefly discussed in this sub-section.

### *Energy resources*

The major sources of energy in Kenya are wood fuel, petroleum and electricity, which account for 70 per cent, 21 per cent and 9 per cent respectively, of total energy consumption. Renewable energy is also becoming important, although it remains insignificant in the country's overall energy mix. The present power generation system has an effective capacity of 1,300 MW with a peak demand of 1,070 MW.

The use of energy resources differs in the rural and urban areas. About 89 per cent of the rural and 7 per cent of urban households regularly use firewood (Kamfor, 2002). For urban areas, it is households with the lowest incomes that depend on firewood the most. Firewood is obtained mainly from agro forestry or on-farm sources (84%), trust lands (8%) and gazetted forests (8%).

Charcoal is primarily an urban fuel. By 2002, about 47 per cent of all households used charcoal, representing 82 per cent and 34 per cent of urban and rural households, respectively. Kerosene, often regarded as a

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<sup>43</sup> Roselyne Obala and Jack Nduri, "Training on fishing starts: 1000 beach management units in East Africa to benefit", *The Standard*, Wednesday, 28 February 2007, p24.

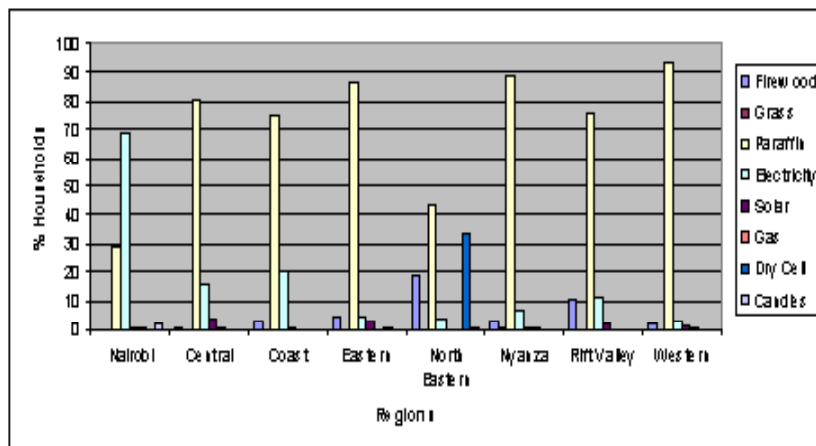
“poor man’s” fuel, is used by approximately 92 per cent of all households (rural–94% and urban–89%), mainly for lighting. Liquefied Petroleum Gas (LPG) is not widely used, with only 7.8 per cent (23% urban and 1.8% rural) households using it. Electricity is the most modern and convenient fuel and ranks highest on the energy ladder. However, it is expensive for the majority of households, and only 46 per cent of urban and 3.8 per cent of rural households (15% nationally) have access to electricity.

Recent figures by the Kenya National Bureau of Statistics show that paraffin is the dominant source of lighting fuel in all provinces, with the exception of Nairobi (Figure 2.10). The main source of cooking fuel also in all the provinces with the exception of Nairobi is firewood (Figure 2.11). The same is also observed with the percentage distribution of households by type of cooking appliance. With the exception of Nairobi, most households use the traditional stone fire as the primary cooking appliance.

The status of energy resources and its management increase inequality in Kenya. The poor and women are vulnerable to the degradation of energy resources, as they have to incur extra costs to obtain the same quantities as before. As Wisner (1987) argues, there is declining household welfare as income is shifted from the consumption of other basic needs (food, soap and clothing) to purchase of domestic energy services.

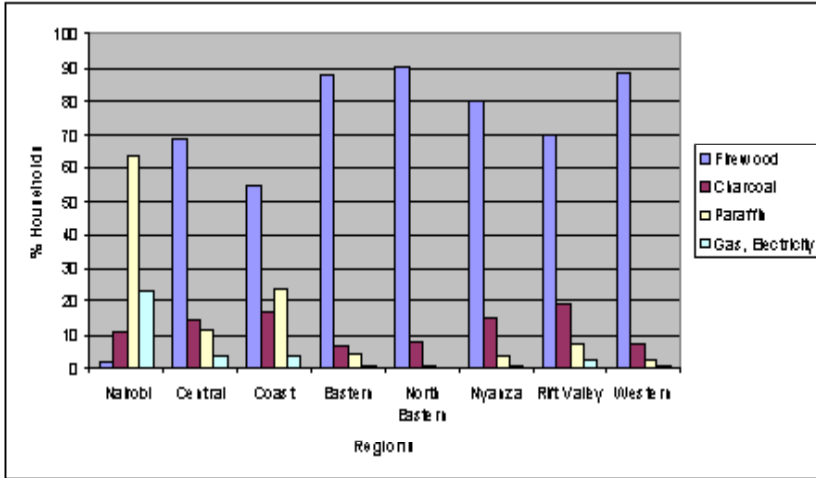
Moreover, the use of traditional types of fuels has negative health impacts on the poor and women. The poor, and women in particular, are greatly affected by indoor air pollution as they use inappropriate kilns and charcoal stoves. Increased shortage of wood fuel and the high cost

**Figure 2.10: Percentage distribution of households by main source of lighting fuel**



Source: KIHBS, 2005/06

**Figure 2.11: Percentage distribution of households by main source of cooking fuel**



Source: KIHBS, 2005/06

of charcoal may lead the poor to use dried dung, resulting in reduced availability of organic fertilizer for agriculture and an increase in indoor air pollution. This may in turn lead to food poverty and poor health . As Cecelski (2000) argues, poverty influences and determines the energy choices of households.

The rich are able to use modern forms of energy that have very little negative health impacts, if any, thereby increasing inequality. Scarcity of appropriate forms of energy increases poverty and slows down growth thereby increasing inequality due to differential impact to the poor and rich. Due to diminishing biomass energy supplies, women and children in some parts of the country are spending increasing amounts of time fetching firewood and other biomass fuels, implying limited study-time particularly for the girl child and little time for other productive activities for women. This reduces labour productivity, thereby worsening poverty especially for women-headed households.

The production of electricity from hydro sources, although environmentally sound, also causes inequality. The generation of hydro power has perverse negative externalities in the sense that the benefits are mainly enjoyed by the cities and industries that receive electricity (World Bank, 2005), while population living in the areas involved in the projects suffer displacement, loss of fishing and productive agricultural land due to flooding, and salinization.

The inequality of access to energy resources is caused by inadequate capacity in the supply of clean forms of energy, poverty, inappropriate legal and regulatory framework and the prevailing social structures. Social structures such as the land tenure system in some situations inhibit access to biomass fuels by women.

The Energy Act 2006 created the Energy Regulatory Commission (ERC), which regulates all the energy resources in the country. The challenge now is the effectiveness of the ERC in discharging its mandate.

The Rural Electrification Authority (REA) has also been established to manage and accelerate the pace of rural electrification in the country. A Charcoal Bill is also being developed, which will ensure sustainable charcoal production. These are expected to address the shortcomings in the previous legal, regulatory and policy frameworks, thereby contributing to the efforts being targeted at the reduction of inequality in the country.

### *Wetlands*

Kenya has about 32 known wetland areas, which can be categorized into two broad types: marine and inland ecosystems. The majority of the country's wetlands are found in Rift Valley, Nyanza and Coast Provinces.

The country's wetlands are shrinking at an alarming rate, largely due to reclamation for settlement and agriculture, and pollution. Virtually all the swamps in Kisii were reclaimed for agriculture and settlement, those of Laikipia are under threat from crop production; while the Yala swamp in Nyanza is being reclaimed for agricultural production (Box 2.12).

The status and management of wetlands affect inequality in the country. Due to flooding in the wetlands, the poor have often suffered. The frequency of floods in Nyando and Budalangi, and recently the coast and north-eastern Kenya, is increasing. But the rich own homes in areas that are not vulnerable to floods. For instance, only 12.2 per cent of households in Nyando basin have permanent houses with stone/brick/block walls (World Agro Forestry Centre, 2006). Houses of the poor have mud walls and are easily washed away. Every year, resources and energy are diverted from productive activities and used to repair damage caused by the floods. Natural and man-made disasters, which become more frequent and severe with degradation of wetlands, have a greater impact upon the poor, who may have no choice but to live and work in locations that are unsuitable and more prone to disaster. The rich have a greater capacity to exploit the wetlands.

**Box 2.12: Wetlands use and inequality<sup>44</sup>**

The problem of access is also being observed in the Yala Swamp. The Dominion Ltd obtained a 25-year leasehold of a big chunk of the Yala Swamp from the government and fenced it off. Initially, the firm was restricted to Area I, but is now going to Area II which is ecologically fragile. The poor smallholder farmers have been displaced and now have less access to the swamp. Moreover, a lot of papyrus has been cleared off by the firm to create room for rice and other crops. Growing crops will eventually require fertilizers and agricultural chemicals, which will pollute the swamp.

A course way has been built across Lake Kanyaboli, effectively preventing fish from reaching their breeding areas. Fisher folk especially in Kadenge and Gangu complain of declining fish in the lake. Moreover, the firm has constructed a wire across River Yala for irrigation. This has affected the ecosystem downstream due to the decreased river flow and created a man-made lake. As a result of these changes, the swamp's buffering capacity and its role as a nursery and refuge for Tilapia are severely being threatened. The firm also intends to put upto 800 fish culture cages in Lake Kanyaboli, as part of its aquaculture initiative, which is likely to lock out fishermen who depend on the lake for livelihood.

Inequality contributes to the degradation of wetlands through conflicts. The scenario observed in wetlands is associated with poverty, political economy, lack of a clear policy and inadequate legal and regulatory framework. A related problem is the lack of capacity in enforcement. NEMA, for example, is yet to develop and gazette important environmental standards for management of wetlands. The Authority lacks adequate technical staff in various disciplines. Lack of capacity is also a problem, with the Kenya Wildlife Service, which is in charge of wetlands.

Although the government has established several sectoral statutes, policies and legislations that impact on wetlands, the country lacks a unified and comprehensive policy, legislative and institutional framework on wetlands. Poor implementation as a result of capacity gaps and weak inter-ministerial and inter-agency coordination also has a bearing on inequality. Indeed, as noted by Mwanje *et al.* (2003), conflicts in institutional mandates are a serious challenge to coordinated formulation and implementation of a coherent environmental policy. With such a sectoral focus, inequality may be inadvertently enhanced in the course of policy implementation. There is an opportunity to address these weaknesses through the wetlands policy that is still in the process of preparation.

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<sup>44</sup> Kenya Land Alliance, "A Survey into the Management and Use of Wetlands in Kenya," *Land Update*, Vol. 5 No. 1 (January – March 2006).

### *Grazing pasture and pastoralism*

According to Waters-Bayer and Bayer (1994), there are several common features that distinguish pastoralists from other rural populations. First, they occupy lowland ASALs, where low human population and considerable climatic variability affect spatial and temporal variation, and the availability of crucial natural resources, notably pasture and water. Second, pastoral land tenure tends to be common property regimes instead of clearly defined plots or pasture. Families, clans and ethnic groups commonly negotiate shared access to resources, and when negotiations fail, raiding and warfare commonly result. The Group Ranch programme was intended to transform communal grazing lands into titled holdings with individual rights and responsibilities of land ownership (Evangelou, 1984).

Pastoral communities in Kenya are facing considerable challenges arising from shifts in land tenure policy from communal to individual landholdings and high human population growth rates. Over the last 30 years, livestock-to-human ratios have generally declined to levels that will no longer support pure pastoralism (Thornton *et al.*, 2006). Pastoralists are caught between new land tenure rules associated with the dissolution of group ranches and sub-division of communal rangelands, and the unchanged ecological challenges of their dryland systems. Poverty among pastoral households is generally high (Thornton *et al.*, 2003), and research over the last three decades indicates a steady decline in tropical livestock units per capita in pastoral areas (Bekure *et al.*, 1991; Rutten, 1992) with a growing divide between wealthy and poorer pastoralists (Fratkin and Mearns, 2003).

While many reasons have been cited for enclosure and individualization, an overriding concern is poor management and lack of accountability (of both the group's committee and in supporting organizations), which severely undermined the incentives for individuals to remain in the group.

Increasing group ranch populations, discord between age-sets concerning registration of new members, unsanctioned allocations to unauthorized individuals, difficulties in enforcing livestock quotas, inability to repay loans issued to group ranches, misappropriation of loans issued to group ranches, and an ambivalent (and often predatory) bureaucracy were problems that created insecurity among group members and pushed them to support subdivision.

Thus, the status of grazing pasture and its management contribute to inequality in the country. First, only adult males were registered as group members, showing a glaring gender inequality even within group ranches. Women and children were assumed to have access through their husbands and fathers (Galaty, 1994). Sub-division outcomes were



remarkably similar in many of the sub-divided group ranches; poorer herders were allocated smaller sized parcels and women and youths were locked out of decision making. Judicial and bureaucratic processes did not offer redress and losers failed to turn around undesired outcomes.

The trend towards sub-division implies dramatic changes in pastoral land use—from a system predicated on extensive seasonal movement and intensive, short-duration grazing of successive areas of the pastoral landscape towards one based on intensive, long-term grazing of private parcels where households have ostensibly fewer options for mobility. Moreover, government agencies and officials benefited from the sub-division (Galaty, 1994) through corruption. Poor pastoralists are migrating to towns and urban centres in search of wage paying jobs (Fratkin, 1994). Wealthier pastoralists tend to live further from towns where pasture is good and more available while the poor tend to concentrate around towns and take up farming, often after losing their herds to disease, drought and cattle rustling (Smith *et al.*, 2000). These areas tend to be more degraded.

Inequality increases as the poor sell their titled areas. Differential effects of cattle rustling and drought are observed between the poor and the rich (Smith *et al.*, 2001). Generally, sub-division results in substantial reductions in livestock numbers, partially because households have to sell more animals to generate the cash needed, with serious long-term consequences on herd sizes and food security. If sub-division occurs, even to parcels as large as 196 km<sup>2</sup>, livelihood strategies may need to be modified to maintain current levels of household well-being (Thornton *et al.*, 2006).

Inequality contributes to the degradation of pasture land in Kenya, as manifested in the numerous land conflicts over pastures in many of the ASAL areas (Galaty, 1994). In Baringo, there is a conflict between poor and rich herders in the rain-fed non-swamp areas (Little, 1996). While the rich can afford irrigated agriculture, the poor can only afford wet season dryland farming where herds are grazed. Security of tenure is complicated when land tenure policy transforms customary rights into individual holdings. This transition can create or exacerbate social and economic inequalities. Women, the young and the poor tend to lose to local elites. Those that have smaller areas tend to have their land degraded due to unavoidable continuous use.

### *Minerals*

Kenya is endowed with a variety of mineral resources, including base metals (gold, silver, copper), dimension stones (granite, marble and limestone), industrial minerals (fluorspar, titanium and limestone), gemstones (ruby, sapphire, rhodolite) and chemical minerals (soda

ash, carbon dioxide, salt and hydrocarbons). The mining sub-sector contributes 3 per cent of the country's total export earnings and about 1 per cent of GDP (Government of Kenya, 2006). Most of the minerals are found in the Rift Valley and Coast provinces, implying that natural endowment account for regional inequality in mineral riches.

The status of mining resources and their management contribute to inequality in the country (Box 2.13). The main players are the private mining companies (mostly medium-sized), groups and individuals who operate separately and independent of each other (KLA, 2008). The mining operations are controlled and run by the rich, with the exception of a few organized groups and individual mines owned and operated by the poor local small-scale miners (KLA, 2008). Mining is largely an extractive industry and also entails the use of chemicals. These methods lead to local and regional disturbances to the surrounding ecosystems, besides the displacement of local communities who are mostly the poor.

**Box 2.13: Mining and inequality<sup>45</sup>**

*A) The private owners of the Kenya Fluorspar Company and the local community*

Local people who were displaced by the Kenya Fluorspar Company Ltd that owns 9,000 ha of land in Keiyo District have never been compensated. Over 4,000 people were displaced and forced to settle on very unproductive and hostile land. The factory is adjacent to Kimwarer River, one of the tributaries of Kerio River, that traverses Baringo District to Lake Turkana. The water from these two rivers is used by the community and other communities downstream for domestic purposes and livestock watering. The company uses the river water during the processing of fluorspar mainly for washing off the soils, debris and sand from fluorspar ore. The company, which uses over 1,000,000 gallons of water daily, resorts to Kerio River during the dry season when the water level is low.

*B) Kakamega gold mines<sup>46</sup>*

In 1952, Roasterman Mining Company wound up its operations in Kakamega District, without rehabilitating the affected area. The abandoned tunnels and wide holes have led to many deaths of the local people. There was also subsequent deterioration of fertility of surrounding farms due to the spreading of dry soils from underneath the ground all over the surface. Over 500 families were displaced by the colonial government from various gold mines in the district without compensation. Locals took advantage of the abandoned holes and tunnels, scooping and sifting the soil with a hope of getting some gold stones. This has been going on for a long time with some getting only between Ksh 400 and Ksh 800 a day from the gold proceeds.

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<sup>45</sup> Discussions with the Provincial Director of Environment, Rift Valley Province.

<sup>46</sup> Kenya Land Alliance, "Desperate Locals Continue to Lose their Loved ones in Endeavors to Eke a Living Deep Inside Dangerous Gaping Holes and Tunnels of Kakamega Gold Mines," *Land Update* Vol. 3 No. 1, (January–March, 2004).

The factors causing inequality with regard to mining are poverty, lack of alternative sources of livelihoods, governance and inadequate legal and regulatory framework. The mining sector is regulated under outdated mining laws (Mining Act Cap 306), which have no provision for environmental protection (KLA, 2008). The challenge has been lack of provisions in the Mining Act to link it with EMCA Act of 1999 that would ensure compliance and effective implementation. Owing to poor dissemination of geological information, the linkage to private sector has not worked well. As a result, only 24 major companies are currently involved in mining activities in the country (Government of Kenya, 2006b). With the participation of stakeholders, the Department of Mining and Geology is now developing a new mining policy and Act to guide the sector and promote private sector participation.

### *Biodiversity*

Kenya has a varied biodiversity resource base that provides food, fuel, wood, medicines and income from tourism. The country has over 35,000 known species of plants, animals and micro organisms, and many unknown and undiscovered species. Thus, the country has one of the largest gene pools. Of great concern, however, is the fact that some species are critically endangered, rare, threatened and vulnerable.

Widespread poverty, especially in the rural areas, leads to over-use and destruction of natural resources where short-term needs are pursued at the expense of long-term environmental sustainability. Over-exploitation of biodiversity resources includes illegal logging, over-fishing, poaching, over-grazing and over-stocking of livestock. These activities pose a significant threat to biodiversity. The country had a very low Global Environmental Facility (GEF) benefits index for biodiversity<sup>47</sup> of 9.9 in 2005 (World Bank, 2007). Already, almost 50 per cent of the country's key biodiversity warehouse is at risk due to reduced habitat and other human induced pressures (Government of Kenya, 2009).

The main causes of biodiversity loss are habitat degradation (decline in habitat, land degradation and habitat fragmentation), over-harvesting of the resources and introduction of invasive species such as the *Prosopis juliflora* (*mathenge*<sup>48</sup>), eucalyptus tree species, predatory Nile perch, water hyacinth and the striga weed (witch weed). Invasive alien species

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<sup>47</sup> Is a composite index of relative biodiversity potential for each country based on the species represented in each country, their threat status, and the diversity of habitat types in each country. Index normalized so that values run between 0 (no biodiversity potential) to 100 (maximum biodiversity potential).

<sup>48</sup> Some pastoralists have taken the government to court for the introduction of this species in the country. The objective of introducing the plant was to prevent environmental degradation. However, the outcome has not been very good. The weed has spread rapidly and is said to be very poisonous.

can change light levels, decrease dissolved oxygen in water, change soil chemistry and its structure, and increase surface run-off (NEMA, 2004). Most importantly, alien species can affect ecosystem processes such as nutrient cycling, pollination, regeneration of soils and energy flows. They can also alter the ecosystem regimes.

Inequality in access to biodiversity resources is caused by poverty, inadequate legal and regulatory framework, governance problems and differential access to extraction technologies. Activities of both the rich and the poor lead to biodiversity loss. The poor are affected more by costs of biodiversity loss. Loss of biodiversity implies less availability of medicinal plants that the poor often use for treatment. *Prosopis Juliflora* is affecting negatively the livelihood of many pastoralists and their livestock. Eucalyptus tree species has led to the drying of many areas, implying lower agricultural productivity and longer distances to fetch water by the poor.

There have been efforts at the international level—Convention on Biological Diversity (CBD)—that came into force in 1993 of establishing national legal regimes to regulate access to genetic resources and the requisite institutional arrangements to enforce it. In 2006, the National Environment Management Authority carried out an assessment of capacity building needs and country specific priorities in the conservation of biodiversity with the broad objective of preparing a capacity building action plan for Kenya. However, the efforts have not made any significant impact. Since biodiversity resources are spread in many sectors, it is crucial that Kenya revises and formalizes<sup>49</sup> *Sessional Paper No. 6 on Environment and Development of 1999*, together with the development and harmonization of policies in related sectors such as mining, wildlife, and land.

Kenya is party to key international conventions on protection of biodiversity, endangered species, the ozone layer, wetlands (Ramsar), and climate (Kyoto protocol), combat desertification, and follow the international Law of the Sea. At present, 35,000km<sup>2</sup> are designated protected areas, aiming at conserving more than 7,000 mammals, bird and plant species. There is, however, a general need to enforce the protection and enhance the level of implementation of the formal political commitments, specifically to adopt modern policies and policy instruments to manage its rich biodiversity and other natural resources, to ensure sustainable use and *capture economic rents*.

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<sup>49</sup> Environmental policy in Kenya is currently being developed.

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### **3. Environmental Externalities and Inequality in Kenya**

#### **3.1 Air pollution**

Air pollution arises mainly from the use of energy and has inequality implications. Emissions from the use of petroleum energy include carbon dioxide (CO<sub>2</sub>), nitrous oxides (NO<sub>x</sub>), dinitrogen oxide (N<sub>2</sub>O), sulphur dioxide (SO<sub>2</sub>), volatile organic compounds (VOCs), lead and particulate matter (PM). Particulate matter concentrations (Urban-population weighted PM<sub>10</sub> micrograms per cubic meter) in the country reduced from 66 to 39 between 1990 and 2004 (World Bank, 2007). By 2004, Nairobi had particulate matter of 45µg/m<sup>3</sup>, about three times higher than the World Health Organization (WHO) recommended level of 15µg/m<sup>3</sup>. This air pollution is responsible for the Upper Respiratory Tract Infections (URTI), which is the second highest cause of morbidity in Kenya. Incidences of URTI morbidity are 6 per cent in urban areas compared to 5 per cent in the rural areas and affect women more (6.2%) compared to men (5.7%) (Government of Kenya, 2008).

Per capita carbon dioxide (metric tons) emissions have been relatively stable at 0.3 between 1990 and 2004 (World Bank, 2007). Methane and nitric oxide emissions by year 2000 stood at 21.5 million tons and 22.6 millions tons of carbon dioxide equivalent, respectively. The emissions may only be a major concern if Kenya's consumption of energy increases rapidly in order to meet Vision 2030 goals.

Sulphur dioxide and nitrogen dioxide are emitted at annual average rates of 5.545 ug/m<sup>3</sup> and 2.464 ug/m<sup>3</sup>, respectively. These levels are well below the maximum allowable annual levels of 50 ug/m<sup>3</sup> and 100 ug/m<sup>3</sup> for sulphur dioxide and nitrogen dioxide, respectively, though they are expected to increase (ERB, 2005). Although there is lack of data, it is evident that air quality in urban towns is lower than in rural areas due to higher concentration of vehicles, industries and people. In urban areas, the rich tend to stay in areas that have better air quality, and far from where industries are located and surrounded by trees.

Air pollution from transport is caused by activities of both the poor and the rich, although the latter have a much larger effect. The rich are responsible for industrial emissions, as industries are often controlled and managed by wealthier households. These households can protect themselves against pollution by living in better neighbourhoods. The poor live near industrial locations, thereby being more exposed to the emissions.

The state of air quality and its management affect inequality in Kenya. Combustion of biomass fuels in confined, often unventilated indoor areas and at low thermodynamic efficiency, leads to high concentrations of

smoke and other pollutants. Cooking using biomass fuels on traditional stoves is a major source of concentrated air pollutants, including particulate matter, carbon monoxide, nitrogen oxides and a number of carcinogenic organic compounds.

Particulates seem to be the primary culprit in smoke-related illnesses. There is a positive correlation between exposure to smoke from indoor biomass burning and acute respiratory infection and chronic lung disease. Ongoing research (Mishra, 2003) is attempting to determine the precise dose response relationship, but it is already clear that long-term exposure to biomass smoke elevates the risk of a child developing acute respiratory infection by 100 per cent to 400 per cent. Women and children are the most vulnerable to indoor air pollution since they are confined to indoor settings for extended periods of time. In addition, living conditions tend to expose people to high levels of indoor air pollution.

Family homes in rural areas generally consist of multiple-use buildings, where the same room or few rooms are used for cooking, sleeping and working. In many cases, the total indoor volume is less than 40m<sup>3</sup> and these homes often have minimal ventilation, which may be further reduced during rainy seasons and cold spells. Under these circumstances, pollutant concentrations resulting from cooking can easily build up to unhealthy levels and remain that way over the course of a day.

Compounding the problem is the type of cooking practised. In Kenya, preparation of the staple maize and bean dish requires several hours of softening and slow cooking that can consume wood at the relatively high rates of 1.5- 3.0 kg/hr. Both indoor and outdoor air pollution have very serious health risks. According to the Medium Term Plan 2008-2012, incidences of URTI morbidity are 6.0 per cent in urban areas compared to 5 per cent in rural areas and affect women more (6.2 per cent) than men (5.7 per cent). With about 63.5 of the population using solid fuel for cooking, Kenya has an estimated 13,000 deaths per year and 12 Dalys/1,000 capita per year from indoor pollution in 2002. In the same year, the deaths from outdoor pollution were 600 and 0.2 Dalys/1,000 per capita (WHO, 2007).

In rural areas, 50 per cent of households dispose domestic waste in farms (Medium Term Plan, 2008-2012). This is associated with the high incidences of environmental related diseases. Diarrhoea, due to poor hygiene, accounts for 2.6 per cent of morbidity and affects 2.4 per cent women and 2.8 per cent men. The effect is more in rural areas than in urban areas, where 2.6 per cent and 2.2 per cent of cases are reported, respectively. High poverty and low awareness levels are some of the factors for the disparities between the urban and rural areas.

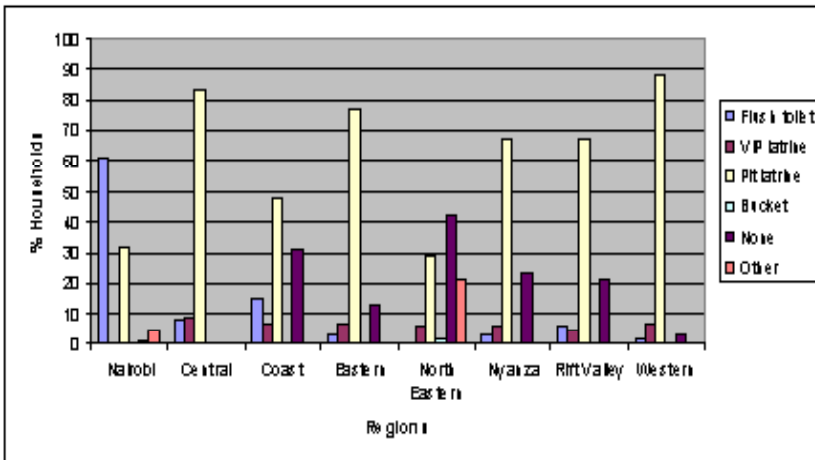
Unlike the poor, the rich use modern forms of energy and have many houses and are, therefore, less exposed to indoor air pollution, which increases inequality between the two socio-economic groups. The causes of inequality are poverty and inadequate legal and regulatory laws on air quality. NEMA recently gazetted air pollution standards. However, effective implementation is hampered by lack of funding and inadequate capacity. Once effectively implemented, inequality would be significantly reduced.

### 3.2 Sewerage and Sanitation

There has been an increase in the generation of solid, liquid and gaseous wastes in most urban centres. About 40 per cent of the wastes are collected and disposed of in designated sites. Most of the local authorities lack adequate disposal infrastructure. The remaining 60 per cent is dumped in undesignated areas. A recent survey by the Kenya National Bureau of Statistics shows that most households use pit latrines (Figure 3.1). North Eastern, Coast, Nyanza and Rift Valley regions have a high proportion of households with no toilet facilities.

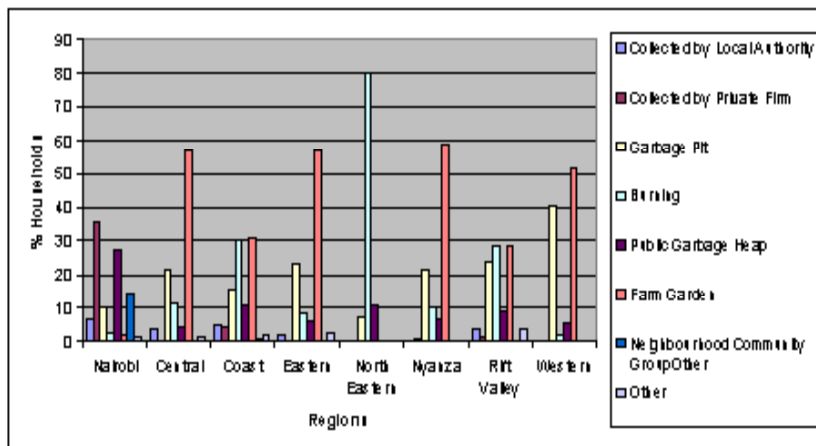
While data is lacking, it is generally the case that in the rural areas the rich tend to have VIP latrines while the poor have no latrine or ordinary pit latrines. The proportion of urban population with access to improved sanitation facilities in Kenya declined marginally from 48 per cent in 1990 to 46 per cent in 2004. However, there is some increase in the proportion of rural population from 37 per cent in 1990 to 41 per

**Figure 3.1: Percentage distribution of households by type of main toilet facility**



Source: KIHBS, 2005/06

**Figure 3.2: Percentage distribution of households by type of waste disposal and region**



Source: KIHBS, 2005/06

cent in 2004. In rural areas, the current (2008) estimated sanitation coverage is 55 per cent.

Waste disposal in the country is generally farm garden in Central, Coast, Eastern, Nyanza and Western provinces (Figure 3.2). However, in Nairobi and North Eastern provinces it is collected by private firms and burnt, respectively.

There is marked inequality in the collection of solid wastes in Nairobi as the western part (high-income and middle-income residential areas) is well catered for by private firms and the Nairobi City Council, while the Eastern part (low-income areas) is hardly served. The 1998 JICA study found that 26 per cent of households in high-income areas, 16 per cent of those in middle-income areas, 75 per cent in low-income areas and 74 per cent of the surrounding areas do not receive any service.

The country lacks a solid waste management policy and it should be developed and implemented as a matter of urgency. It is encouraging to note that a Ksh 9.2 million plastic waste management<sup>50</sup> project was launched in April, 2008.

### 3.3 Urban Slums

Informal settlements often in the neighbourhood of palatial residences are one of the most striking manifestations of the socio-economic inequality in Kenya. Evidence from Demographic and Health Surveys indicates that the urban poor in the country have less access to health

<sup>50</sup> "Ksh 9 million Plastic Recycling Unit Launched", *Daily Nation*, 8 April, 2008.



services, and consequently exhibit higher mortality rates than residents from other population sub-groups, including rural residents (APHRC, 2002). The poor live in unhygienic environments characterized by poor drainage systems, inadequate or non-existent sanitation and piles of uncollected refuse. For instance, Nairobi city produces 1,500 tons of solid wastes daily, but refuse collection service is limited especially in the informal settlements, and in the end only about 25 per cent of this solid waste is collected and taken to designated dumpsites (UNEP, 2005).

A study conducted in Nairobi informal settlements (APHRC, 2002) found that only about 24 per cent of all households have access to piped water in form of public water taps or water piped into residence, versus 92 per cent in non-slum areas of Nairobi as a whole. Consequently, most of the residents of informal settlements (75%) purchase water for domestic use (Wasao and Bauni, 2001).

Because of their illegal status, informal settlements are built in marginal areas in contravention of current planning and building regulations and do not receive government services such as water, drains, sewerage and rubbish collection (Caldwell & Caldwell, 2002; United Nations, 1996). It is estimated that 40 per cent of world deaths can be attributed to various environmental factors (Pimentel *et al.*, 1998; and Clarke, 1993). It is now estimated that 60 per cent of Nairobi residents are poor and live in congested informal settlements that occupy only 5 per cent of the residential land area (APHRC, 2002).

The epidemiological profile of the informal settlements reflects their poor living conditions. In terms of child health, the African Population and Health Research Centre-APHRC (2002) established that 31 per cent of children under three years in the informal settlements suffered from diarrhoea, compared to 13 per cent of similar children in Nairobi as a whole. This rate was considerably higher than those in other urban and rural areas despite higher educational attainment; about 73 per cent of all the respondents had completed primary school or gone to secondary school, compared to only 46 per cent for rural residents and 68 per cent for residents of other urban areas. Measles coverage was found to be lower in the informal settlements compared to Nairobi and other urban areas. In addition, infant mortality rate (IMR) was higher in Nairobi's informal settlements (9.1%) compared to the non-slum parts of Nairobi (3.9%) and rural Kenya (7.6 %).

Housing inequality in urban areas is largely attributable to poverty, inadequate legal and regulatory framework on physical planning and weak governance. The country also lacks a solid waste management policy and framework.

There have been some initiatives by the government and the Catholic Church on slums upgrading programmes such as Kibera and Mathare in Nairobi, though little progress has been achieved. Because of poverty,

once a slum has been improved and upgraded, the dwellers move and form another one. The draft land policy proposes to allocate land to dwellers in the urban informal settlements. However, such land is likely to be purchased by the relatively well off, who currently own the shanties rented to slum dwellers. The National Environment Management Authority (NEMA) has also gazetted water quality and waste management regulations which, if well implemented, will reduce the problems of solid waste disposal.

### **3.4 Climate Change**

Climate change may have far reaching implications for Kenya for various reasons. First, the country's economy mainly depends on agriculture, which is very sensitive to climatic variations. A large part of the country is arid and semi-arid and is highly prone to desertification and drought. The country also has a fragile highland ecosystem, which is currently under stress due to population pressure. Forest, water and biodiversity resources of the country are also climate sensitive. Vector borne diseases such as malaria, which are closely associated with the climatic variations, are common. Moreover, infrastructure such as roads, bridges and electricity (which is predominantly hydropower), are also vulnerable to climate effects. Climate change is also causing the disappearance of glaciers on Mt Kenya. Only 11 of the 18 glaciers that covered Mount Kenya's summit a century ago remain, leaving less than one third of the previous ice cover. The ice on the mountain has also become thinner (UNEP, 2009).

The Intergovernmental Panel on Climate Change (IPCC) predicts that, "the effects of climate change are expected to be greatest in developing countries in terms of loss of life and relative effects on investment and economy." Global warming is already affecting Kenya, as evidenced by droughts, floods, decline of water in rivers, coral reef bleaching, loss of animal species and decrease in snow cover on Mt Kenya. These effects are bound to have a negative impact on the Kenyan economy.

A recent study (Kabubo-Mariara and Karanja, 2006) found that climate affects agricultural productivity in the country. The study further shows that increased winter temperatures are associated with higher crop revenue, while increased summer temperatures have a negative impact.

Climate change affects livelihoods of the poor more than the rich because the former are more dependent on the natural environment. Poor people, especially those living in marginal environments and in areas with low agricultural productivity, depend directly on genetic, species and ecosystem diversity to support their way of life. As a result of this dependency, any impact that climate change has on natural systems will threaten the livelihoods, food intake and health of the population.

In a study on constraints on adaptation to climate change, about 60 per cent of households were hindered by lack of credit and savings (Kabubo-Mariara and Karanja, 2006). Poverty and lack of knowledge, which are associated with the poor, seem to be more critical constraints in the medium and low potential zones than in high potential zones. The rich are able to invest in adaptive technologies and are thus less vulnerable to climate change.

Climatic shocks in the ASAL areas affect poor pastoralists more disproportionately than the richer (McPeak and Barret, 2001), who do not lose most of their animals and are able to re-stock. As users of natural resources that are affected by climate change, women will have to walk further to look for water and firewood, thereby increasing gender inequality. The same applies to pastoralists who have to go far to access water and pasture as water sources dry up and pastures are lost.

With increasing temperatures and extreme weather events, climate change will further erode the quality of the natural resource base, thereby reinforcing conditions of poverty. The impacts of climate change are becoming serious. Box 3.1 shows that climate change is estimated to reduce long-term growth in Kenya by about 2.4 per cent of GDP per annum.

There is evidence that future climate change may lead to a change in the frequency or severity of extreme weather events, potentially worsening these impacts. Box 3.2 reveals the devastating effects of drought caused by climate change.

**Box 3.1: Economic costs of climate change in Kenya<sup>51</sup>**

The total costs arising from 1997/98 floods (damage to infrastructure and communications, public health hazard, and loss of crops) have been estimated at Ksh 70 billion (USD 1.0 billion) by the World Bank. The 1999/2000 La Niña-related drought particularly affected the agriculture, livestock, energy, industrial production and tourism sectors (on loss of crops and livestock, forest fires, damage to fisheries, reduced hydro power generation, reduced industrial production and water supply) with costs estimated at Ksh 220 billion (USD 3.2 billion) by the World Bank. The repeated pattern of periodic droughts and floods leads to longer lasting effects. On average, every seven years Kenya experiences a flood that costs about 5.5% of GDP (Ksh 37 billion; USD 0.5 billion), and every five years experiences a drought that costs about 8% of GDP (Ksh 53 billion; USD 0.8 billion). This translates to a direct long-term fiscal liability of about 2.4% GDP (Ksh 16 billion; USD 0.23 billion) per annum. The annualized cost of floods largely arises from capital losses (bridges, roads, etc), indicating steady degradation of its infrastructure because of climate extremes. The annualized cost from droughts largely appears as losses of annual production.

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<sup>51</sup> DfID Kenya Climate Screening and Information Exchange, see <http://www.dewpoint.org.uk/Article.Aspx?ArticleID=901>

**Box 3.2: Conflicts over water in Isiolo<sup>52</sup>**

In Isiolo District, Sambarwawa is a place where groups of pastoralists congregate in times of drought. Each group is allocated a space on the dry riverbed to dig a shallow well for water. They are allowed to bring their animals to drink here once every four days. "It's a sort of cafeteria system to ensure everybody has a chance to get water for their animals," says local leader Wako Liba. But the system has been under extraordinary strain because of almost a decade of drought.

By December 2005, some 10,000 herders with 200,000 animals had descended on the tiny Sambarwawa, many trekking 400km from the epicentre of the drought in east Turkana and Wajir. Although the village had not seen rain for a year, they knew they could still find water under the riverbed, but the shallow wells began to dry up. "As the water level dropped, I foresaw conflict," says Liba. "Some herders started encroaching on boreholes owned by different communities. As one group pushed to water its livestock, another moved to restrict access to the few boreholes that had enough water." As the drought intensified, the pressure finally led to killings. "Gunshots reverberated the whole night," Liba recalls. "By the time I came down, seven people had died. There were dozens of injuries. Animal carcasses littered almost a kilometre stretch of the valley."

David Kheyle was queuing for water when the fight broke out. "There was grumbling that evening. A good number of boreholes didn't have water so the queues were relentless," he says. "People were becoming impatient. Suddenly, there was a scramble at the northern end of the valley... it was a free-for-all. But it later took on an ethnic dimension when people aligned with their kind to defend themselves."

Edwin Rutto of the Africa Peace Forum, says that there is an "established correlation between drought and violent conflict". With recurring droughts associated with climate change, poor pastoralists are stuck in an ever-tightening poverty-trap. "After people go through a period of relative recovery, then another drought hits. People are living in a state of perpetual suffering," says Rutto.

There are strong links between climate change and increased disease, particularly among the poor (Patz *et al.*, 2005).<sup>53</sup> Strong evidence exists of linkages between weather variations and increases in the incidence of infectious diseases such as insect vector-borne diseases (e.g. malaria, Rift Valley Fever) and epidemic diarrhoeal diseases (e.g., cholera and shigellosis). The estimated toll of human deaths due to Rift Valley Fever (RVF) was 200-250, while there was an estimated 89,000 human cases of RVF in North-Eastern Kenya.<sup>54</sup> According to *Christian Aid*,<sup>55</sup> an estimated 182 million people might die in sub-Saharan Africa from diseases associated with climate change by the end of the century.

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<sup>52</sup> Africa – Up in Smoke 2: The second report on Africa and global warming from the Working Group on Climate Change and Development, 2005.

<sup>53</sup> <http://www.smh.com.au/news/world/climate-change-will-fuel-disease-among-poor/2005/11/17/1132016927103.html>

<sup>54</sup> <http://chge.med.harvard.edu/publications/documents/enso.pdf>. Accessed on 16th April 2009.

<sup>55</sup> [http://www.ekklesia.co.uk/contents/news\\_syndication/article\\_061112kenya.shtml](http://www.ekklesia.co.uk/contents/news_syndication/article_061112kenya.shtml)

The association between climate change and HIV/AIDS is by no means direct, but it is real. AIDS has led to lowered productivity as more and more farmers are infected and affected. Many survivors have to spend time attending funerals, looking after orphans or managing the estates of the deceased. Absenteeism from school and work is common. At the same time, unreliable rain patterns, which are becoming a permanent feature in many parts of the country, have led to massive crop failures of such magnitude as to lead to severe malnutrition, which accelerates the negative effects of the disease and poverty. Girls suffer disproportionately; to survive they may be forced into early marriage or prostitution. Many rural folk migrate to towns due to crop failure where they are at a higher risk of infection because of malnutrition.

With the possible extinction of plant species used in traditional medicines, climate change will impact on people's ability to tackle illness. As the examples above have depicted, climate change has a myriad of effects, with the poor being disproportionately more vulnerable. It is thus contributing to socio-economic and gender inequality.

Farming households in Kenya are aware of both short-term and long-term effects of climate. Further, more than 80 per cent of households in some parts of the country have implemented various adaptation mechanisms to counter short-term climate variations, compared to 60 per cent and 70 per cent that have implemented various mechanisms to counter long-term temperature and precipitation changes, respectively (Kabubo-Mariara and Karanja, 2006). It is important for Kenya to mainstream the adaptation to climate change and other environmental issues into its development planning.

Provision of fiscal incentives to stimulate development and adoption of technologies that reduce green house gas emissions, increased funding to the Kenya Meteorological Department to improve its forecasting ability, increased funding for research and data collection, educational programmes for increased awareness of climate change problems, and tax relief to individuals and firms that adopt climate adaptation measures are likely to be helpful. Besides, opportunities under the Clean Development Mechanism (CDM)<sup>56</sup> facility and other sources of funds could be explored and the money used to enhance the poor's capacity to adapt to climate change.

An environment coordination division has been established in the Ministry of Environment and Natural Resources charged with the responsibility of implementing recommendations from the twelfth meeting of the conference of parties to the United Nations Framework

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<sup>56</sup> Under CDM, rich countries can keep within their Kyoto emissions limits by funding cuts in poor countries, getting the so-called carbon credits in return. Poor countries such as Kenya could then use this money to reduce the differential effects of climate change.

Convention on Climate Change (UNFCCC). Kenya signed and ratified the 1992 Framework Convention on Climate Change and the 1997 Protocol to the Framework convention on Climate Change in 1994 and 2005, respectively. The challenge lies in the actual implementation of these agreements.

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## **4. Conclusions and Policy Implications**

### **4.1 Conclusions**

There are several conclusions arising from this study. Evidence has been observed of worsening degradation of environment and natural resources (notably land, water, forests, wildlife and fisheries) in the various provinces and in the country. Some of the environmental hot spots include wildlife dispersal areas such as the world-famous Maasai Mara, the Mau Forest Complex, Lake Victoria fishery and Lake Naivasha wetlands.

There are varying levels of dependence of environmental and natural resources, with the poor being more dependent than their relatively richer counterparts. Women are the most affected by degradation of environment and natural resources. Children too are vulnerable to the degradation, as they may be more exposed to indoor pollution and may lose school time when they are forced to spend time searching for water and firewood.

The distribution of environment and natural resources is not equitable across the country, which accounts for the significant regional inequality. There are regional differences in endowments as exhibited by land, forests, fisheries, water, wildlife and minerals, among others. Access to these resources differs among socio-economic groups and gender. Evidence suggests that the rich have a relatively higher access than the poor. Women have less access, particularly to land and fishery resources, due to culture and social taboos.

There is a vicious cycle between inequality and the status and management of environment and natural resources in the country. On the one hand, the state and management of the environment and natural resources influences inequality through natural endowment or distribution, through its effect on economic growth and poverty, and through the fact that the poor people are more dependent on nature while the rich have greater capacity to exploit nature and, unlike the poor, are better buffered against the consequences of over-exploitation. On the other hand, inequality impacts on the integrity of the environment and natural resources through its effects on economic growth and poverty, disincentive to conservation on account of initial distribution of access and use rights, cooperation failure among stakeholders as a result of breakdown in social order, and conflicts. The increasing population pressure in many parts of the country also tends to exacerbate the problem of inequality.

Institutional factors, including formal and informal regulatory frameworks, largely explain differential access to environment and

natural resources by different socio-economic and gender groups in the country. These include lack of sectoral policies, inadequate policies and regulatory frameworks, weak enforcement capacity, and culture and social taboos that prevent women from inheriting land and engaging in fishing. Although the country has some policy documents that directly or indirectly affect the management of environment and natural resources, there is no comprehensive policy that addresses the management of the environment and natural resources holistically. Moreover, one challenge of enforcing environmental law is the inconsistency between EMCA 1999 and the sectoral statutes; yet these resources are important in reducing poverty and inequality.

The study shows the need for the country to pursue new and deepen existing pro-poor programmes geared towards addressing gender inequalities. Laudable policy in this respect is the new government pledge that 30 per cent of all new jobs in the public sector would be reserved for women. It is becoming clear that it will take a deliberate shift in government expenditures to address the growing inequality in the country. In addition, a conducive and responsive environmental policy is necessary for equitable resource allocation to regions via the national budget. As Kiringai (2006) argues, there has been political patronage in public spending especially on large infrastructure projects and staffing of state corporations. Besides, the overall budget allocation to the environment is rather miniscule.

## **4.2 Policy Implications**

Although weak in many areas, the evidence presented in this study shows that there is a vicious cycle between the management of the environment and natural resources and inequality in the country. Thus, interventions that improve the management of the environment and natural resources and those that reduce inequality are desirable. In other words, policies to reverse environmental degradation should not be pursued in isolation from socio-economic policies. There is need to harmonize environmental and developmental goals so as to ensure sustainability.

The management of the environment and natural resources has a considerable influence on inequality (both income and gender). Ongoing policy, legal and regulatory review efforts (constitutional, environment, land, wildlife, wetlands, etc) provide an opportunity to introduce measures aimed at reducing inequality, which have become perhaps the leading political issue in the country. The recently developed long-term strategy for the country, Vision 2030, also provides an opportunity to strengthen integration of environmental and inequality concerns into overall economic and social development policy. The integration process could be achieved through a multi-sector framework to ensure



that environmental management and the conservation of biodiversity/natural resources are an integral part of societal decisionmaking. These efforts should therefore be supported.

Measures that would reduce inequality include those aimed at addressing skewed access and use rights, corruption and poor governance in general and poverty (through targeted pro-poor policies and programmes), those aimed at increasing and sustaining economic growth, and a policy environment that is conducive for equitable resource allocation to regions via the national budget. Pro-poor re-distributive programmes alleviate poverty because they transfer incomes and assets to persons below the poverty line. Targeted policies that involve payment for environmental services especially by the rich and subsidies for the poor in some particular activities may be beneficial. In the water sector, for example, differential user charges and tariffs could be applied based on income levels. Non-governmental organizations and development partners should continue focusing on targeted pro-poor policies and programmes.

While pro-poor growth policies should continue to have positive impacts on reducing the incidence of poverty, it is crucial that these and related social and economic policies take significant account of environmental poverty issues. Particular focus is needed on investments for rural dry land areas and urban slums with high pollution exposure. The complexity of the problem clearly requires integrated and cross-sectoral approaches.

Reducing inequality itself has beneficial impact on the health of the environment and natural resources. It does this by facilitating cooperation between different resource users, maintenance of social order, and reduction of conflict. Thus, regional inequalities should be addressed through government expenditures on public infrastructure such as roads and water supply. Investment in infrastructure can help integrate the economy by linking up fragmented domestic markets for environmental goods and services. By trying to integrate the whole economy, one can unlock poverty traps in remote areas and reduce inequality and at the same time involve people in the marginalized/peripheral areas in the growth process.

In addition, the decentralized funds programmes such as Constituency Development Fund (CDF), school bursaries, free primary school programme, HIV/AIDS funds, and roads funds, together with recent new policies on women employment in the public service and the Youth Fund provide an opportunity to address the various types of inequality. Development partners should support the government in these efforts, together with efforts being made to improve governance. It is thus proposed that environment and inequality aspects be made important elements in the disbursement of decentralized funds. NGOs can help in ensuring that devolved funds go into environmental sustainability.

Moreover, the fraction that goes to the environment can be used as an indicator for performance of devolved funds.

The capacity of public institutions such as NEMA, Department of Remote Sensing and Survey (DRSRS), and KWS needs to be enhanced, through additional financial and human resources, for them to fully discharge their mandate. In particular, DRSRS need to be transformed to effectively collect data on natural resources to help in planning. Increased collaboration with civil society organizations should also be facilitated to ensure better outcomes. Local authorities too need to be strengthened as they are increasingly crucial in the management of environmental and natural resources that are on trust land. Increased human and financial resources are key.

The capacity of civil society organizations and the community in general also needs to be strengthened to enable them participate meaningfully in policy formulation and governance. To compensate for weak governance systems, it is necessary to strengthen resource governance institutions through funding and training. Moreover, where they are lacking, Resource User Groups should be formed and members trained on aspects of sustainable and equitable use of the environment and natural resources. Participatory Rural Appraisals (PRA) and Rapid Rural Appraisals (RRA) approaches can help communities better understand and manage inequalities. By training community members in participatory planning, monitoring and evaluation, communities can progressively take charge of designing their own natural resource management plans.

Increased awareness through non-governmental organizations as well as capacity building on power relations could be vital in this regard. When people become aware and are empowered, it is likely to address inequalities brought about by power relations.

Finally, given the importance of inequality in the country and the weak data showing the link between it and environmental and natural resource integrity, more research is recommended. Such research should involve carefully designed case studies that would identify and measure the magnitude of the links. This will not only avail more credible evidence to policy makers, but it will also identify clear interventions to address inequality.

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