



Environment and Natural Resources as a Core Asset in the IGAD Region for Wealth Creation, Poverty Reduction, and Sustainable Development: Kenya National Situation Report

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September 2007



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EXECUTIVE SUMMARY:

Environment and Natural Resources as Core Assets in the IGAD Region for Wealth Creation, Poverty Reduction, and Sustainable Development: Kenya National Situation Report Summary

Introduction

Kenya is a land of contrasts. It has a range of physical and geological formations. The Great Rift Valley splits the country into two regions. It has expansive plains and a range of mountains with the peak on Mt. Kenya 5200m above sea level. In addition its position astride the equator, position in relation to the Indian Ocean and Lake Victoria, make the country experience a wide range of climatic conditions and a large number of ecosystems. Ecological zones range from very arid to very humid. This is further manifested in the very rich biodiversity and agricultural systems that the country is endowed with. The country is listed as one of the ten mega-diverse countries in the tropics.

The ecosystems provide different services for the livelihoods of the communities that live within and outside them and therefore all face different human pressures that are leading to environmental degradation. To ensure the ecosystems withstand the current human pressure, sustainable land management (SLM) must be encouraged. SLM is management that reverses land degradation, maintains or enhances the supply of ecosystem goods and services, alleviates poverty, and promotes development.

Development is about enhancing the livelihood of people, particularly the poor. A livelihood is the means of living that people in a household build for their well-being through access to and use of the assets they need for this purpose. These livelihoods assets include: human capital; social capital; natural capital; physical capital; and financial capital.

Land degradation is a threat to rural livelihoods. It is a hazard to the natural capital (the land, water, wildlife, biodiversity, grazing etc) of local communities and the nation because it depresses the capital locally but ripples through the whole economy.

Therefore sustainable rural development should be about the enhancement of rural livelihoods through the protection and enhancement of livelihood assets, promoting and securing access to these assets, and promoting diversification of the use of these assets. It includes the creation of new livelihood opportunities off the land. In particular, SLM should address sustainable development

soils, atmosphere, flora, fauna, natural reservoirs like aquifers, rivers, lakes, seas and oceans). These are essentially ingredients to the livelihoods for every household.

They are all being degraded through unsustainable utilization by the ever increasing populations. The per capita availability of resources like water and biomass fuels is now critical. This is exacerbated by lack of or inappropriate use of technology in the conservation and production and changing consumption patterns. This just spells gloom and doom to the communities concerned.

Because of high population demands, hunting/ gathering systems are replaced by higher scientific and technological systems to conserve or efficiently produce more in sectors like agriculture and manufacturing industries, as well as in preservation of products for longer shelf life. They are all for the provisioning of the following man's basic needs: food, clothing, water, energy, shelter, health, cultural fulfillment and security.

People's livelihood systems, wealth creation and fight against poverty and disease revolve around basic needs that are in turn the provisioning and cultural services of ecosystems. Below is a summary on how the natural resources are core components of people's livelihoods in Kenya's socio-economic fabrics:

Agriculture for poverty and food insecurity eradication: Poverty and hunger (food insecurity) and diseases have been the 3 big challenges in Kenya since independence. Agriculture is key to Kenya's overall national economic and social development. It contributes about 26% of GDP and a further 27% through linkages with other sectors. It contributes about 60% of national export earnings. It is the main source of livelihoods for the majority (80%) of Kenyans who live in the rural areas. The ASALs alone host about 70% of the national livestock population with an estimated value of about Kshs 70 billion. Pastoralism provides direct employment and livelihood to over three million Kenyans.

However due to population pressures and use of poor or inappropriate production technologies and marketing, >57% of the population live below the poverty line due to land degradation and declining productivity. This has resulted in over 50% of Kenyans being food insecure. These are indications that the ecosystems' natural resources are being overstretched and degraded leading to food insecurity, poor health and poverty intensification.

Sustainable and high productivity in the agriculture sector will depend on investments, technologies applied, seeds quality, marketing infrastructure, soil and water conservation. SLM is therefore the key to breaking the land degradation and poverty vicious cycle.

Production of fibers for clothing: The production of fibres is part of the agricultural production systems. Industrial processing and value addition of the cotton, wool and hides contribute significantly to the livelihood systems of Kenyans. The industry has declined over the last 10-15 years due to the structure of world market. This decline has contributed to poverty intensification in the affected areas. *New production and protection policies are needed to address the unfair trading regimes in the world market.*

Water for life, agriculture and industry: Water is for domestic use, agriculture and livestock productions and hydropower production. It is the most limiting factor in the provision of other services in the 80% of Kenya (ASALs) that host ~35% of Kenya's population. Rainfall is seasonal, low and erratic with uneven temporal and spatial distribution, resulting in uneven distribution of watering points. Therefore nomadic pastoralism is practiced as a production strategy by the nomads that follow water and forage. In contrast, the humid and marginal dry sub humid zones receive enough rainfall for sustaining rain fed agriculture for a range of crops for each sub zone and

livestock keeping. In urban areas water is needed for domestic and industries which provide livelihoods to many families. Inter-basin transfers for Nairobi, Mombasa, Nakuru have become necessary because of local shortages. Per capita freshwater availability is 930m³, below the internationally accepted 1000m³. This makes Kenya a water scarce area. Because of the climatic factors, rapid population growth and industrialization, per capita water availability will decline to only 235m³ per capita per annum by the year 2025.

In all ecosystems frequent drought and/or flood hazards threaten lives, property, infrastructure and cause food shortages and hunger, all of which affect the livelihoods of the communities.

Water harvesting and conservation measures including recycling must be put in place in order for this resource to continue sustaining livelihoods and industrialization of the country.

Energy for domestic and industrial services: Energy is needed for cooking, heating, lighting, industry and transport. Kenya's total national energy demand relies on biomass (80.5%), petroleum (18.0%) and electricity (1.4%). Petroleum is imported and the rest is sourced from local ecosystems. This underscores the contribution of biomass fuels to livelihoods in the country. In the rural areas biomass energy accounts for 98% of energy needs.

In 2000, it was estimated that the country experienced a deficit of 20million tones of biomass fuel which will rise to ~31.2 million tones in 2015. This demand is leading to over-harvesting and severe degradation of the forests. The business of selling firewood and charcoal making is a livelihood to a large number of farmers and traders. Woodlots for fuel are now a source of livelihood due to demand. The charcoal making and marketing chains employs ~500,000 persons with 2 million dependants. It is estimated that the industry's annual gross revenue is up to Khs.32 billion.

Production of hydropower demands a good and constant supply of water to hydro reservoirs from the catchments areas. The reservoirs often have other uses including domestic water supplies, irrigation, fisheries and recreation. This means a number of livelihood systems revolve around hydro dams.

A strategy is needed to either increase fuel wood population, use of energy efficient technologies or switch use to electricity and fossil fuel.

Shelter (housing) and forestry: The materials for shelter (housing) include timber, poles, thatching

intensified in the last ten years. The political leaders have been calling for reforms starting with the constitution. But it has taken nearly two decades to finalize reforms in only three sectors (environment, water and forest), several draft sectoral policies and a rejected draft constitution. On the ground however some communities are ahead of policy and laws. For example community conservancies are in place and some working well ahead of wildlife policy review; water user associations were formed ahead of the water policy and act; and individual and community forestry is ahead of the forest policy and act which will promote the activity.

Success in implementation of existing policies and laws is always mixed because it depends on resources, capacity, determination and political will. Successes include community conservancies, Water Trust Fund, community forestry and failures include loss of state forests and biodiversity.

d. Equitable distribution of costs and benefits of devolved natural resource governance

All new policy and legal reforms consider equity including gender equity. There is now a general sense that all governance structures should include at least 30% women to influence their own course. The draft land policy recognizes wome

This situation prevails in most of the products from local communities and ecosystems including natural products that the communities offer in the market. These include the tourism industry, natural products industry, livestock industry, fisheries industry, the wood-fuel industry and many others.

Strategies for successful commercialization

There is therefore a need to map out services provided by various ecosystems to enable land use zoning as proposed in the draft land policy. The non-marketed services can be approximated and each ecosystem will have its importance and particular services that it offers and therefore be conserved appropriately.

b. Extent to which NR assets are reflected in national and regional marketing and trade

A number of natural resources are traded and reflected in national trade including timber, fuel-wood and charcoal, non-timber forest products, mining, fish industry; hydropower, piped water and tourism. At the regional level little trade goes on in natural resources products. The main reason why there is little trade between the states is because the products are the same and there is no value addition to most of them. Cross-border can be improved by putting in place value addition processing plants in any of the countries to encourage export of the raw material and may be importation of the finished product.

5. Emerging issues

a. Key emerging issues and how they impact or are impacted by environment and NR base

Key emerging issues in Kenya are HIV/AIDS and other pandemic, conflict and insecurity, effects of globalization, invasive species, climate change and adaptation, GMOs, and carbon trade. Each is impacted or impacts the environment differently.

HIV/AIDS and other pandemic: Since 1986 more than 75% of all AIDS cases occur in adults between the ages of 20-45, the most productive age bracket in society in every aspect. They are the main bread winners, field producers or workers in all sectors including agriculture. It therefore means that food production declines and the nutritional status of the affected family members

provide to man and thus affecting the traditional socio-economic fabrics of the communities. Because of rapid of proliferation, eradication is difficulty and very costly.

Their economic usefulness has become controversial especially that of the water hyacinth whose weight is ~98% water. Although good as livestock fodder, the *Prosopis* forms dense impenetrable thickets that bars livestock from effectively utilizing it apart from inconveniencing travel by people.

2. Livelihoods - wealth creation and poverty reduction

Natural resources as core component of people's livelihoods

An ecosystem provides four major services to man (MA (2005) and Kenya's ecosystems are not exceptional:

Provisioning services: These are services that support production of goods that are basic human needs – food and cash crops, livestock, water, fibers, timber, biomass fuel, medicines.

Regulating services: Services that enable ecosystems regulate their health in perpetuity – regulating micro and macro-climates that ensure survival of the ecosystem's biodiversity, air quality, water quality, waste sinks, and flood protection, and control of disease vectors.

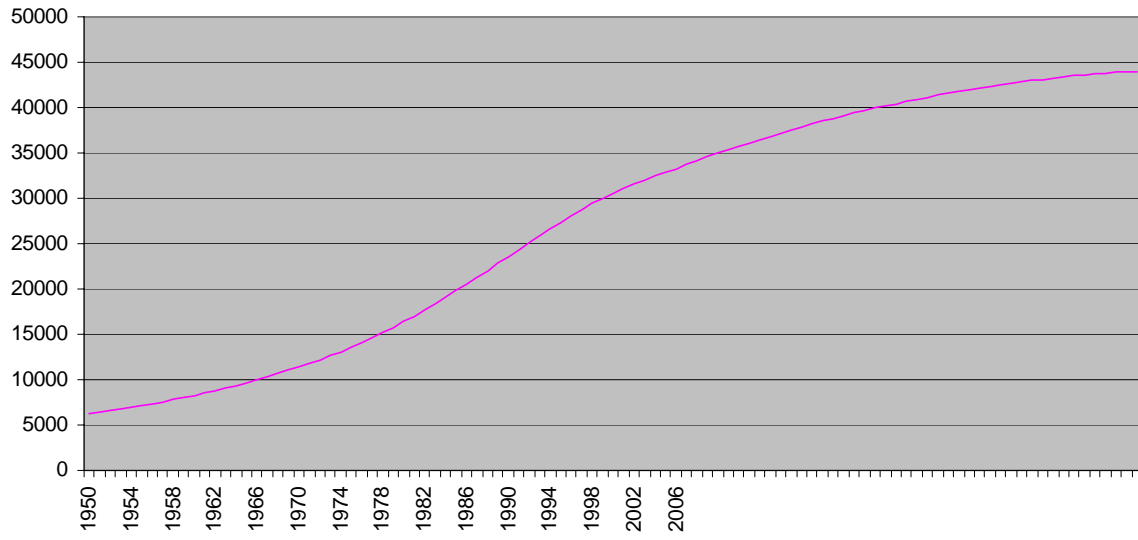
Cultural services: Services that provide cultural and spiritual enrichment, recreational, tourism and scientific education.

Supporting services: These are services that maintain the character, structure, nature, and stability of an ecosystem. They include air circulation, nutrient cycling, soil formation, biomass production, water circulation. These services enable ecosystems provide the other three services – provisioning, regulating and cultural services.

The critical resources of an ecosystem for a household are land and natural resources thereon:

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Figure 1. Kenya's Population trends and projections 1950-2050



7. **Cultural** fulfillments of individual and community inner souls. These are cultural, religious and recreational facilities, sites, paraphernalia and other tools and equipment. These are gotten from sacred animals, trees, sites like special forest sites, caves, mountains etc;
8. **Security** for the community and race against human and environmental threats or risks. This is gotten through weaponry (offensive and defensive that are constructed from environmental goods) and fortressing (forts, dykes and levees, dams, bunkers, - all constructed out of local or imported natural resources.

People's livelihood systems are directly linked to or revolve around the provisioning and cultural services of an ecosystem as outlined above. Live

food production services. Land degradation and desertification are of great concern to Kenya. They lead to food insecurity, frequent famines and poor health of the people and poverty intensification.

SLM is therefore the key to breaking the land degradation and poverty vicious cycle.

Production of fibers for clothing

The production of fibers (cotton, wool), skins and leather are part of the agricultural production systems. Industrial processing of the primary agricultural products (cotton, wool and hides) lead to finished products that we ordinarily wear for protection from the vagaries of the environment and as cultural attire. These primary and secondary activities contribute significantly to the livelihood systems in the rural and urban areas of Kenya. However the production of cotton and wool in the country has significantly declined over the last 10-15 years due to the structure of world market for these commodities rather than because of environmental degradation. This decline contributes greatly to poverty intensification to the production areas due to lack of alternative livelihoods.

The Government has to carefully craft a policy on the production and protection of fibers vis a vis the unfair trading regimes on the same commodities.

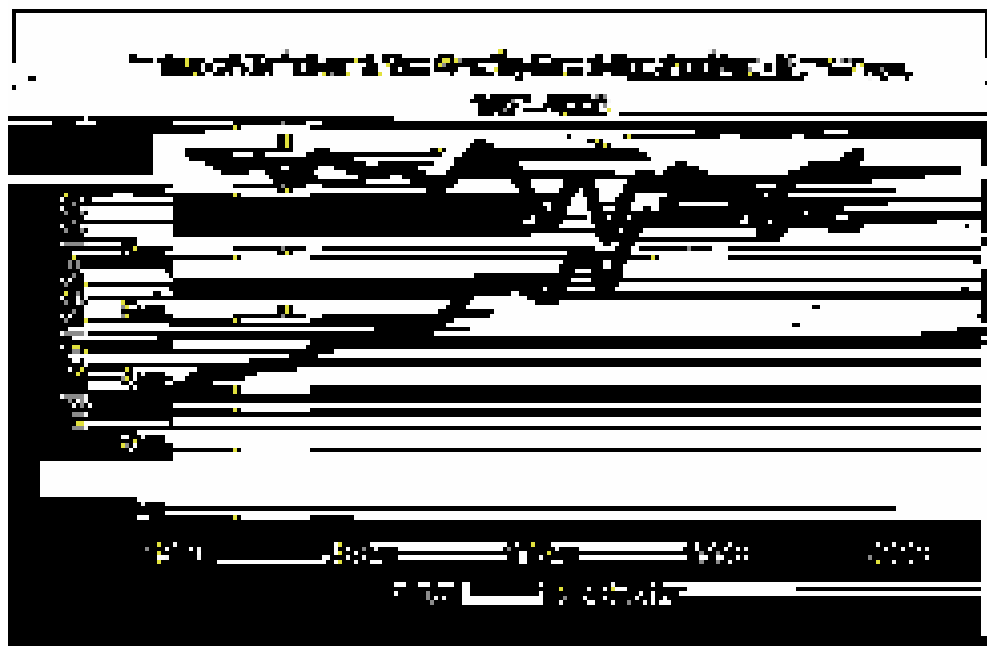


Figure 2: Index of total and per capita food production in Kenya 1981-1988 (Source: WRI website, 2005 <http://earthtrends.wri.org>)

Water for life, agriculture and industry

Communities use water for drinking and domestic uses, agriculture and livestock productions. This is normally available from rain, rivers, lakes, aquifers and ingested foods. Water might be the most critical limiting factor in the provision of other services in the greater part of Kenya than any other natural resources in the ecosystems.

About 12% of Kenya comprises of the hyper and humid zones. These are in the high rainfall areas of the country, which also contain the country's 'water towers'. They receive over 1,200mm of rainfall annually. Water is not the most limiting factor here.

About 8% of the land mass is the marginal dry sub humid zone. It receives 800-1200mm of annual rainfall. Seasonal shortage of water can be experienced here.

The arid and semi-arid lands (ASALs) occupy about 80% of the country and host over 10 million people. They receive less than 800mm annual rainfall. Water is the most limiting factor here because of the low and erratic rainfall patterns in these zones. Most of the waters of the towers traverse through these areas through seasonal surface drainage systems or aquifers. Thus the ASALs greatly depend on ground water most of the year (WRI et al 2007).

The linkages between rain water resources and livelihood systems in Kenya are striking. The humid and marginal dry sub humid zones receive enough rain for sustaining rain fed agriculture for a range of crops for each sub zone. These zones also sustain livestock keeping. However, the ASALs receive low erratic and unreliable rainfalls that lead to pastoralism as the main livelihood systems that is viable here. Irrigated agriculture is only possible where there is enough water and good soils in the ASALs. Frequent droughts in these zones make the area vulnerable to famines.

In all zones frequent too much rain (El Nino rains) are hazards that cause havoc in terms of floods that kill animals and destroy crops and infrastructure, all of which affect the livelihoods of the communities.

In major urban centers like Nairobi, Mombasa, Kisumu, Eldoret, Nakuru and Nyeri water is needed for domestic and industrial use. Inter-basin transfers for Nairobi, Mombasa, Nakuru have become necessary because of local shortages. Water as a resource for energy services is treated elsewhere below.

Energy for domestic and industrial services

Energy is needed for cooking, heating, lighting, industry and transport. These are gotten from biomass (charcoal and fuel wood), hydro, fossil fuels, nuclear reactors, wind, and solar. However, Kenya relies on three major types of energy, namely: biomass energy, fossil fuel (petroleum) and electricity (hydro and geothermal). Petroleum is imported and the rest is sourced from local ecosystems.

Biomass energy is sourced mainly from firewood, charcoal, biogas, biomass (wood) wastes and farm residues. According to studies by Ministry

Figure 4: National energy supply by source (Source: SOE 2004)

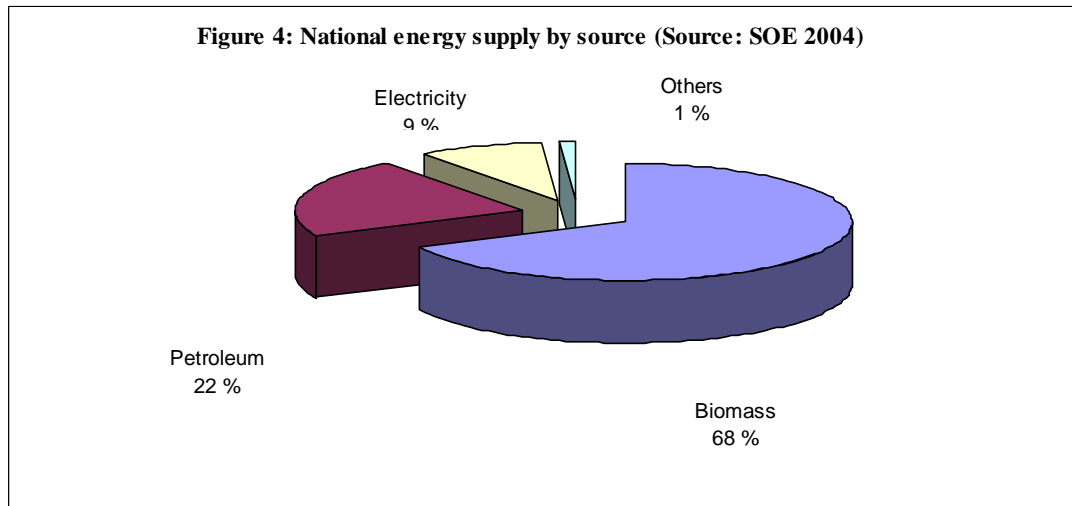


Table 1: Total energy consumption by type and for all sectors in '000' gigajoules in the year 2000 in Kenya

Fuel Sector	Firewood	Charcoal	Industrial Wood	Wood waste	Farm residue	Petroleum	Electricity	Total	% share
H0useholds	230779	218330	-	2183	36835	13475	2939	506061	73.1
Cottage	20900	45774	-	1342	178	401	1273	68349	9.9
Agriculture	-	-	-	-	-	4496	-	4496	0.6
Transport	-	-	-	-	-	45678	-	45678	6.6
Commerce	-	-	1747	-	-	60910	5622	68280	9.9
Total	251680	264104	1747	3525	37013	124960	9834	692863	100
% share	36.3	38.1	0.3	0.5	5.3	18.0	1.4	100	

Source: RoK 2006b

Shelter – housing and settlements – Timber and forestry

Shelter is for individual and family protection against environmental elements like extreme temperatures, rain, and suns rays. The goods for shelter (housing) are extracted from the environment – biomass (e.g. timber, poles, thatching and walling materials), rocks, clay soils, bricks, as well roofing and walling tiles. Synthetic tents also are increasingly playing a role in shelter making. Good housing and human settlements is a function of availability of cheap materials especially timber.

The timber industries on the other hand rely on protective and productive forestry. However the forest cover of the country has continued to experience pressure and now stands at 1.7% of the country’s land area while the internationally recommended cover should be a minimum of 10%.

The majority of wood harvested from the plantations is for timber and poles. Of the 120,000ha designated as forest plantations only 78,000ha were sufficiently stocked with trees in 1999. Thus the new forest policy gives more protection to the remaining indigenous forests (RoK 2007). But in the long run it targets plantations, private and community forestry including agro-forestry to meet the ever increasing demand for timber and poles. Farmers are already responding to the high demand for wood by planting woodlots in their land parcels especially in the high potential areas where the acute shortages are biting.

Currently the forest / timber industry employs a large number of people and contributes about 8% GDP. The construction industries depend on productive forestry for poles, timber, rafts, and shatter poles. Poles are also needed in the distribution of electrical and telephone lines.

A part from supplying timber, forests provide other services to communities and the environment. Good forest cover mitigates the effects of droughts, floods and soil erosion. They trap, store and regulate flow of rain water through the systems. The remaining forest cover protects parts of Kenya's water towers. These forests directly or indirectly support agriculture, fisheries, hydropower producti

have an annual retail value worldwide of about \$65 billion where microbes, fungi and others comprise 80% and 20% from higher plants (Mwangi 2007). These are just indicators that demand for health products from natural products are on the rise and have great economic and social development potentials.

The traditional medicine practitioners have formed associations and practice openly. Some are well recognized

Cultural fulfillments

The environment and some natural resources play an important role in maintaining and fulfilling certain cultural requirements of individual and communities so that they remain in peace with nature. These are cultural, religious and recreational facilities, sites, paraphernalia and other tools and equipment. These are gotten from sacred animals, trees, sites like special forest sites, caves, and mountains. Special culture forests in Kenya include the Kaya sacred forest of the Mijikenda people at the coast; the Njuri Njeke sites of the Ameru people,

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- Raise the productivity of smallholder farmers and to encourage private sector

- MDG 3, target 4: Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education by 2015.
- MDG 4, 5, 6 as far as health is concerned
- MDG 7, target 10: Halve by 2015 the proportion of people without sustainable access to safe drinking water;
- Energy as having been recognized as an important target area in Kenya.

Having established a coordination office at the Ministry of Planning and National Development for integrating MDGs into the main development frameworks, the Government of Kenya has indicated its determination to achieve the MDGs. The needs assessments were carried out by the coordination office.

6. Natural resource governance (rights, equity including gender, devolution)

Devolution of natural resource governance to people and communities

Environmental governance in Kenya consists of various legislations, standards, regulations, and institutions that implement them. Before the enactment of the Environmental Management and Coordination Act (EMCA 1999) as an overarching framework law, environmental laws in Kenya were scattered and many. Some were out-dated and working at cross-purposes with each other (NEMA 2003). The National Environment Management Authority (NEMA) and subsidiary bodies implements EMCA.

EMCA devolves administration of a number of environmental and natural resources management issues to communities. The devolvement includes the structures that oversee the issues at various levels.

For example, at the national level there is the National Environment Action Plan Committee (NEAP) which facilitates the integration of environmental considerations into policies, plans, programs and projects. It is supposed to prepares a national environment action plan every five years.

EMCA also created the Provincial and District Environmental Committees (PECs and DEC)s. They are responsible for the proper management of the environment within their jurisdictions (provinces and districts).

Further EMCA gives power to organized and registered communities to formulate environmental actions and /or conservation and management plans of areas of particular interest to them. However these environmental actions and management plans must be vetted and approved at various levels before approval and registration by NEMA. They have proved to be rigorous, time consume, expensive and sometimes politically charged. Thus many communities have not been able to reap benefits from their resources.

The mushrooming of community conservancy areas is a case in point. There are many success stories and many failures and disappointments. The success or failure in many cases come about because of the land and tenure system in application, level of education and awareness of community leaders, the applicable laws and politics.

The EMCA also provides for devolution of management responsibilities to lower levels sectorally, which allows for the lead agencies and departments to integrate environmental issues in all policies, programs, plans, and projects at the various levels.

Since the enactment of EMCA in 1999, the main sectoral policies and laws have undergone or are in the process of reviews so that they are responsive to the current time issue and in tandem with EMCA's requirements. Some of these requirements are that they need to devolve management of the environment and natural resources up to community levels. Those that have successfully gone through include the Water policy and act (2002) and the Forest policy

will. The loss of forests is a case in point where the policy is to stop invasion, loss and degradation of forests in Kenya but this continued unabated for a very long time.

For example the rhetoric and EMCA requirement that a NEAP be formulated every five years and facilitate communities formulate own environmental and natural resources management and action plans are often heard but on the ground communities are still ignorant or find difficulties in going through the process because of various reasons including legal hurdles and knowledge on how to do it as well as appreciation of the benefits that could accrue from such an activity.

Positive examples include the setting up of the Water Trust Fund. The operations have started and communities are already benefiting from its support. This is an example where communities see benefits seize the opportunities and create demand for the services. The demand for seedlings of the high yielding cloned *Eucalyptus spp* for most ecological zones is another example where the communities are seizing the opportunity to have their own forests or woodlots to take advantage of the high demand for wood-fuel, timber and poles. The law now facilitates this and good prices and income are an incentive.

Equitable distribution of costs and benefits of devolved natural resource governance

As indicated above, all policy and legal reforms undertaken or being undertaken must consider equity including gender equity. There is now a general requirement written or

By-Products Layer chain: The main by-products are hides and skins. Components of this layer include: hides and skins shades, dealers, processors, and exporters.

Players in these market chains are also many:

Players in the live livestock marketing chains include: producers, traders and middlemen including brokers; businessmen including slaughterhouse operators, butchers and exporters; community based livestock development groups; security service providers for trekkers and truckers; transporters especially truckers and trekkers; local Authorities who are owners of marketing facilities and charge cesses; Ministry of Livestock Departments who are veterinary regulators and service providers; NGOs who sometimes support producers to improve productivity and fight poverty.

Players in the meat chains include: slaughterhouse operators; wholesale marketing depots; retail butcheries, shops and owners; meat transporters; large Cold storage and owners; traders; veterinarian and public health workers; local councils; slaughter-men; hides and skins merchants; government departments; meat traders association; meat processors; labourers; exporters; and consumers.

Players in the dairy and by-products chains are equally many as for the live animals and meat chains.

At the end of each chain layer there are various expected products:

- Products of the livestock marketing chain are: health live animals for slaughter and export markets.
-

Collins and Welford (2007) have identified six strategies that successful commercialization of natural products from Africa. These are probably applicable to other products and to Kenya as well. These include:

- Supply chain development that include production and processing technologies and quality standards; volumes of production; communications; quality certification and verification; and logistics.
- Trade services to the communities that will focus on local, regional and export markets. The services can include business planning, pricing strategies, product branding, packaging, export facilitation and value addition.
- Product (biodiversity) product research and development that lead to the determination of commercial value properties of the product; quantity of the product available; and technologies most appropriate for the production and processing of the product.
- Market development by proactively identifying potential market partners and then developing close relationships with the partners.
- Long-term investments are a key to success.
- Regulatory negotiations. Regulatory mechanisms are often a big hurdle for the success of commercialization of products locally and in international markets. Most developed countries have stringent restriction on new products entering a market and its therefore necessary that negotiations at high levels be conducted successfully.

New approaches and instruments being developed include payments for environmental services. In this respect communities can receive payments or incentives from another party for adopting sustainable ecosystems management practices that improves ecosystem services and goods for the paying part. Such payments for ecosystem services may include payments for watershed protection, biodiversity markets like ecotourism and herbal medicine, and carbon sequestration / carbon trade which are payments for planting trees to absorb carbon to offset the payer's carbon emissions. A feasibility study is being carried out in the Baringo basin by DDC in collaboration with ICRAF and RAE to establish the viability of this carbon trade approach for communities (UNDP 2007).

Further to the above marketing strategies, rural people can better engage in the market so that larger proportions of income from natural resources are trapped at the community and family levels through three actions that can be derived from the above livestock market chains:

- Shorten the market chains and control marketing cost elements in order to benefit producers;
- Provision of market information;

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Policy, institutional and structural impediments for market engagements and the solutions

As implied in the above analysis there may be four main challenges for the development of markets in order for communities to gain meaningful livelihoods from their natural resources and products:

- **Weak policy and legal frameworks** in support of local communities and their products.

and this needs long term investments and determination by the government. Actions by the government can also include tax breaks, subsidies and promotions to enable them have a competitive edge in the international markets.

- **Low productivity and lack of standards and quality control mechanisms** in support of the communities and their particular products. Production and processing technologies and quality standards must be provided to the farmers so that they can increase production volumes to economic levels. This should be accompanied by government recognition, certification and verification for universal acceptability and market development.
- **Inadequate market information** that will act as incentives to the rural people and investors alike. This is extremely important for local communities to act as conservation agents for their own economic and social development.

In the international trade arena the poor farmers from developing countries are disadvantage. Advantage should be taken at the international forums to advance these concerns and available instruments include the Multilateral Environmental Agreements (MEAs) and other bodies like UNCTAD, WTO and Doha Round Agreements; and CBD protocol on access and benefit sharing of genetic resources currently being negotiated.

How communities can sustainably process and value-add on NR based products

The livestock and livestock products market chains is an example where a community's labor is not equitably rewarded. The marketing cost elements especially those of high transport costs, brokering, transit security, various cesses and taxes, and loss of animal quality can be avoided if processing were to be done close to production sites. This will, in addition, create employment to community members.

Unfortunately investments for any products at the local level mean that there should be in place several incentives for the investor who may be the community, the government, or independent investor or all working together in partnerships. These may include tax breaks, assurance of a minimum production volume and quality, existence and access to the market and returns in minimum time. These are investment conditions that the government must create to support the rural people. The aloe growing and processing plant in Baringo is a case in point where the community has partnered with Kenya Agricultural Research Institute (KARI) and an investor to ensure farmers grow quality aloe and have a ready market and processing facility within the community.

Beekeeping and honey processing is becoming more and technically available to a large number of communities. Processing can be done at the community level while certification can be done by Kenya bureau of Standards (KeBS). However organized local and export marketing is still lacking. Beekeeping and honey production is environmentally sustainable and socially and economically beneficial.

Ecotourism may be environmentally sustainable and economically beneficial but may cause loss of cultural traditions and values.

The production and processing of most other natural products from the species mentioned above – *Osciris spp*, *Aloe spp*, *Prunus spp*, *Acacia spp*, *Jatropha spp*, *Commiphora spp*, neem tree products, gum arabica, and various indigenous vegetables – should be socially and economically beneficial but some incentives and controls to prevent over-exploitation must be in place for that to be environmentally sustainable.

Market chains for NR products – their equity and efficient

The market chain for the natural products at the lowest level includes the producers/suppliers who may be individuals or communities, who produce or gather the raw materials from the ecosystem. The communities may be supported to produce, gather the products by technical

support from line technical government departments or NGOs. Raw material buyers/businessmen together with transporters are a set of players in the chain that will

including maintenance of biodiversity and grazing resources, surface and ground water resources and biodiversity. These services are not reflected in the national accounts. It can only be said that it is partly and indirectly accounted for through the livestock industry.

Ignorance and/or non-recognition of these services lead to invasion of these areas and subjecting them to unsustainable agriculture and loss of grazing lands and biodiversity. Eventually pastoralism and the livestock industry will be affected.

There is therefore a need to map out ecosystem services provided by various regions and ecosystems that will enable land use zoning as proposed in the draft land policy. The non-marketed services can be approximated and each ecosystem will have its importance and particular services that it offers and therefore be conserved appropriately. The RoK (2006d) reckons that environmental services accounting is not carried out in Kenya because of

6. Emerging issues

Key emerging issues and how they impact or are impacted by environment and NR base

A subjective ranking of the importance of emerging issue in Kenya will be as follows, with HIV/AIDS ranking at the top:

- HIV/AIDS and other pandemics,
- Conflict and insecurity
- Effects of globalization
- Invasive species,
- Climate change and adaptation,
- GMOs,
- Carbon trade,
- “food miles”,

Four examples will suffice.

HIV/AIDS and other pandemic

Although HIV/AIDS prevalence is on the decline in Kenya, the pandemic has had and continues to have significant impacts on the environment due to the loss of the productive members of society who would normally take care of the environment. Since 1986 more than 75% of all AIDS cases occur in adults between the ages of 20-45, the most productive age bracket in society in every aspect. Prevalence rates peaked at about 13% in the year 2000 but the good news is that this has been declining steadily and stood at about 6.5% in 2003 (RoK 2006e).

The negative impacts are that the youths to middle aged are the most affected. They are the main bread winners, field producers or workers in

The conflicts affect the environment in various ways:

- Refugees concentrate in generally safe areas and strain natural resources base to the extreme in terms of water, fuel-wood, and grazing requirements. Health services in many cases also rely on herbal medicine.
- Resource conflicts lead to over concentration of livestock in areas with combined

- (v) The production of fibers for clothing especially cotton and wool has significantly declined over the last 10-15 years due to the structure of world market for these commodities rather than because of environmental degradation. This decline contributes greatly to poverty intensification to the production areas due to lack of alternative livelihoods.
- (vi) Annual per capita availability of fresh water is declining rapidly due to rapid population growth. The per capita water availability is already at 930m³, which is below the recommended 1000m³, making Kenya be designated as a water scarce area. It will be below 235m³ by the year 2025 if appropriate conservation interventions are not put in place.

It is therefore recommended that water harvesting and conservation measures including recycling must be put in place in order for this resource to continue sustaining livelihoods and industrialization of the country.
- (vii) Biomass energy contribution to total national energy demand by all sectors is 80.5%. The rest is from fossil fuel (18.0 %) and electricity (1.4%). This underscores the contribution of biomass fuels to livelihoods in the country. The scarcity of biomass fuel is already biting and measures are urgently required on the ground to address the situation. This is reflected in the rising prices of charcoal and firewood in the market.
- (viii) Supply of timber for shelter, furniture, housing and settlements relies on protective

- (xix) Rural people and communities can better process and value-add on natural resource based products in a manner that is socially beneficial and environmentally sustainable through cutting down marketing costs and the government putting in place supportive policies like incentives for investors that include tax breaks, assurance of a minimum production volume and quality, existence and access to the market and returns in minimum time.
- (xx) The market chain for the natural products at the lowest level includes the producers/suppliers who may be individuals or communities, who produce or gather the raw materials from the ecosystem. The communities may be supported to produce, gather the products through technical support for example from line technical government departments or NGOs. Raw material buyers/businessmen together with transporters are a set of players in the chain that will enable the processing investors receive the raw materials. Investors for processing the products locally or away from the producer community are an important group in the market chain.

Natural resources economics and national accounting

- (xxi) Only part of environmental service provisions are reflected in the national accounting system directly or indirectly in the GDP. Natural resources that are formally marketed as goods and services appear in the national accountice

