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Planning and Management of Natural Resources: A Case of Sub-Saharan Africa

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ABSTRACT
The world population has been increasing over time, causing an increase in demand for natural resources and threatening their replenishment. Most natural resources are non renewable. Excessive and unplanned exploitation leads to extinction, acute scarcity, widespread pollution, and uncertain feedback loops. This raises a need to discover new techniques which can effectively help in exploitation without compromising the needs and desires of future generations. There have been attempts to formulate policies on the usage of natural resources for most developing countries, especially those in the Sub-Saharan Africa, but planning and management of these resources still remains a major concern. Existing policies need to be re-evaluated to determine the rationale behind their failures. New policies focusing on planning and management of natural resources also need to be formulated and effectively implemented to improve economic growth and development. This paper reports on research, technologies and options for sustainable natural resource utilization and effective management of land, water, soil, wildlife, minerals and forests in the horn of Africa. It is possible to achieve sustainable development by controlling natural resources through proper management and planning.
Key words: Policy, Population, Natural resources management

INTRODUCTION
Natural resource management refers to the management of materials or substances (that occur in natural state and have economic value) such as land, water, soil and plants, with a particular focus on how management affects the quality of life for both present and future generations (stewardship) (Bojo, 2000). Natural resources are often characterized by the variety of their existence. They may be further classified in different ways depending on their chemical nature, their abundances and availability or their distribution (Moll, 2005).

Allocation and exploitation of natural resources has generated debate the world over. This is partly due to increasing scarcity due to over-exploitation and also because the exportation of natural resources is the basis for the expansion of many economies especially in the developed nations such as Australia. The basic characteristic of natural resources being finite means that if they are used them continuously without proper planning and management, they will eventually be depleted (Bojo, 2000).

Natural resources greatly contribute to the GDP of many sub-Saharan countries. They are especially an important share of export and government revenue for most of the countries in the region. This has prompted these countries to formulate policy strategies to enhance the management of their resources. Empirical evidence suggests that translating this resource wealth into stronger economic performance and a higher standard of living has been challenging (Lundgren, 2013). Among the major challenges facing these countries are the volatile and unpredictable nature of natural resource prices, the exhaustibility of these resources and the difficulty of transforming natural resource wealth into productive human, physical, and financial assets particularly due to lack of institutional and administrative capacity to manage public finances well.

The policies formulated to address the existing challenges have over time proved to be weak or poorly implemented. Natural resources therefore continue to be at the risk of depletion. Making the right policy decisions in managing these natural resources coupled with strong governance and fiscal regimes to ensure the right implementation will result in a high payoff so as to compensate for the lost opportunities for strong growth and economic development. The focus of this paper is therefore on closing the loopholes in the existing policies and formulating new policies to close the existing gaps for proper implementation in the planning and management of land, water, soil, wildlife, minerals and forests of sub-Saharan Africa.

Water

Water is a significant natural resource upon which agricultural production relies. Water is also a point of conflict as competing demands for a limited resource creates tension and conflict. These demands are fueled by the emergent need for water for urban use, industrial use and environmental use that competes with the existing need for water to sustain agricultural production (Rosegrant, 1997).

Water resources include surface and groundwater sources (blue water); rainfall (green water) and recycled wastewater (grey water). Whether or not water shortages occur is an issue depending on geographic location, season and demand for water. However, reducing the pressure on water can be considered of importance due to upstream and downstream consequences as well as associated impacts.

According to the United Nations Environmental Program (UNEP) water scarcity report (2007), roughly one-third of the world's population lives in countries where there is moderate to high water stress. Most of the countries south of the Sahara are classified by the United Nations as chronically water scarce. A country is categorized as water scarce if its annual water supply is less than 1,000 cubic meters, the global standard benchmark for a country to be considered as adequately supplied with water (UNEP water report, 2007). Governments in sub-Saharan countries have over time developed strategies to address the water crisis with little progress. This has been through policy formulation and implementation. However, the process has not been as successful as they would have intended.

Major concerns on existing policies affecting water

The main problems regarding water in sub-Saharan Africa include: extremely limited per capita endowment of freshwater resources and high hydrological variability, both temporally and spatially, unreliable annual rainfall, droughts and when it rains; frequent flooding, poor management of water resources, rapidly growing demand for water for most sectoral uses and inadequate storage capacity. The water towers continue to be severely damaged through encroachment by human settlements, agricultural expansion, rapid human population growth, destruction of forest vegetative cover due to illegal logging, charcoal burning, poorly planned tourist facilities, water pollution, over/illegal abstractions by industries and urban settlements. Thus, the region is classified as a water scarce country.

The major policy statements in most of the sub-Saharan countries are based on**: e**nsuring increased per capita water availability above the international benchmark of 1000 m^3,ensuring progressive restoration and protection of ecological systems and biodiversity in strategic water catchment areas, maximizing use of trans-boundary water resources in coordination with other countries, encouraging storm water management and rainwater harvesting, improving inter-basin water transfer, improving pollution control, establishing sound research and development in the water sector, enforcement of regulations, improving effluent waters treatment and recycle for use, ensuring sustainable groundwater resources for present and future generations, ensuring sufficient funds for sustainable development and management of water resources, resolving conflicting mandates by better cross-sectoral coordination and developing a water management system which contributes to the protection of the environment (Ministry of Water in Kenya, 2012).

In light of this, there is dire need for reforms in the water sector as most of the steps taken are not feasible while others have been poorly implemented. The following represents strategies to ensure effective management of the water resource for sustainable agricultural productivity:

Changes required in policies on water

Better integrate water priorities into agricultural Policies

Water priorities that have been articulated need to be more fully integrated into and well implemented through sectoral policies both at national and regional levels. Agriculture is a major user of water and impact water quality, therefore, within these sectoral policies negative incentives should be reduced and water issues addressed.

Governments should seek to establish polices aimed at reducing water losses, increasing water savings and efficiency as this will have a greater impact on sustainable agricultural productivity.

Several complementary approaches must be promoted. First, water savings and more efficient use of water should be achieved through water metering, improving irrigation efficiency, reducing leakages to a sustainable economic leakage level, and irrigation scheduling. In particular, water metering should be introduced and enforced via water policies. Secondly, improved water availability should be achieved through water re-use, rainwater harvesting and storage. Standards should be developed for water reuse. Thirdly, improved land and soil management approaches will provide important water benefits.

Technologies such as drip and pivot irrigation can improve water-use efficiency and decrease salinization while maintaining or increasing yields. They have been used in industrialized nations on high-value horticultural crops, but their expanded use currently is not economically viable for staple food crops. In developing countries, 15 million hectares have experienced reduced yields owing to salt accumulation and water logging. Investment in such water-efficient technologies, however, is best facilitated when water is valued and priced appropriately (FAO, 2001). All these measures are meant to reduce the wastage of water therefore ensuring that much of it is used in irrigation practices leading an improvement in agricultural productivity. As a result future generations will be taken care of in terms of food security since less wastage ensures a continuous supply which is uninterrupted.

Improve decision-making through the provision of better information and improve water allocation rules

Water is, to a large extent, a local issue but with cross-border dimensions and subject to change in time, so the same activity in different catchments, years or seasons may not have the same impact. Improved tools that provide information at the right scales and resolutions are necessary for policy makers, businesses and farms. Decision support tools, for example irrigation scheduling for farmers, robust methodologies for accounting for water balances and ecological flows to inform water allocation and pricing, and a thorough cost-benefit analysis including externalities, should be developed and used more widely.

Irrigation scheduling will reduce losses in usage of water and introduce regulations which will seek to ensure that there is a proper utilization of available water depending on the needs and the farmer's crops. Such effective management of irrigation water will lead to sustainable agricultural productivity.

SOIL AND LAND MANAGEMENT

While the over application of inorganic and organic fertilizers has led to environmental contaminationin a number of areas in the developed world, insufficient application of nutrients and poor soil management coupled with harsh climatic conditions and other factors, have contributed to the degradation of soils in Sub-Saharan Africa.

Climatic Conditions and Soil Management

Harsh climatic conditions contribute to soil erosion in several parts of Sub-Saharan Africa. Rapid water evaporation and inadequate and highly variable rainfall, for instance, deprive plants of the water necessary for growth. High atmospheric temperatures, strong light, and heat-retentive, sandy soils can combine to make the local environment too hot for proper plant growth. Powerful, dry windgusts may also damage plants through both lodging (which causes plants to fall over and die beforeharvest) and evaporation (Lawson and Sivakumar, 1991). Together, these harsh climatic factors, coupled with poor soil management, have reduced soil fertility by contributing to soil and water erosion.

Slight to moderate erosion slowly strips the land of the soil, organic matter, and nutrients necessary for plant growth. This degradation increases the opportunity for drought and further erosion because it reduces the water-infiltration and waterholding capacity of the soil (Crosson, 1986). Severeerosion may create gullies that interfere with farm machinery use. It also leads to the conversionof land to lower-value uses, or its temporary or permanent abandonment. Off-farm erosion can leadto siltation in watersheds and a decline in water quality (Scherr and Yadav, 1996). In such an environment,effective soil, water, pest, and crop management becomes absolutely essential. But economicand other pressures often make it difficult forfarmers and their families to efficiently manage thesoil for long-term profitability and sustainability.

Property Rights, Land Constraints, and Demographic Pressures on Soil Fertility

Insecure and crumbling tenure arrangements alsocontribute to declining soil fertility. Communalrights to graze land without any effort to maximizelong-term returns have led to serious overgrazing,which is reported to be the main cause of humaninduceddegradation in Africa. Ill-definedproperty rights and insecure tenure rights havealso reduced the incentive for farmers to undertakesoil fertility-enhancing investments. Securetenure arrangements can help induce investmentin soil fertility to reap the long-term reward ofsustained high crop yields and greater profits.

The effects of declining soil fertility on yield growthare particularly visible in Africa, where the mostserious food security challenges exist and lieahead (Badiane and Delgado, 1995). The low levelof chemical fertilizer use, decline in soil organicmatter, and insufficient attention to crop nutrientstudies contribute the most to the loss of soil fertilityin the region (Kumwenda et al., 1996).In comparison to the rest of the world, fertilizeruse in Sub-Saharan Africa is low and declining. In1996, Sub-Saharan Africa consumed only 1.2million tons of fertilizer, (equivalent to 8.9 kilogramsper hectare of arable land. By comparison,global fertilizer use reached approximately 135 million tons in 1996, equivalent to 97.7 kilogramsper hectare (FAO, 1998 and 1999).

Fertilizer use would probably be even lower if foreign aid werenot available. More than half of the nitrogenous, phosphate, and potash fertilizer consumed indeveloping Africa is imported in the form of aid.In 1990, 22 of 40 Sub-Saharan Africa countriesreceived all their fertilizer imports as aid (Fertecon, 1993). High import prices contribute to the low levelof fertilizer use in Sub-Saharan Africa. High fertilizerprices arise from small procurement orders(tenders for less than 5,000 metric tons are common),weak bargaining power, and high freightand international marketing costs. When coupled with hightransportation costs due to poor infrastructure, thedomestic prices of chemical fertilizer are such that one kilogram of nitrogenous fertilizer can cost thetypical African farmer between 6 and 11 kilograms of grain, compared with 2 to 3 kilograms ofgrain in Asia (Heiney & Mwangi, 1997).

Continuous cropping and erosion reducethe level of soil organic matter (Woomer et al., 1994). Low-input systemscan maintain and enhance soil organic matterthrough crop rotation and intercropping, the applicationof animal and green manures, fallowing,and reduced tillage (Kumwenda et al., 1996). But aspressure on land and crop intensification increase,these options do not remain practical. The adoptionof intercropping and crop rotation technique is often constrained by the extent of land and technologyavailable and by the lack of knowledge about optimal management techniques.

Government Commitment toAgriculture and StructuralAdjustment

Although agriculture is increasingly recognized asthe engine of economic growth in Sub-SaharanAfrica, the level of government commitment to it islow. The lack of competition and heavy governmentregulation, along with structural factors such asinadequate institutional and physical infrastructureand underdeveloped research and extension systems, have often made fertilizer distribution systemsinefficient and ineffective in meeting farmers 'needs (Bumb & Baanante, 1996). Structural adjustment programs (SAPs) have been instituted in many countries partly in response to these and other market failures.

SAPsseek to reallocate resource use in order to improveeconomic efficiency and social welfare. Amongother things, the programs have devaluedexchange rates, the immediate effect of which hasmade imports such as fertilizers more expensive,which in turn has often increased farmers' costsmarkedly. Nitrogen-to-maize price ratios inGhana, Tanzania, and Zambia, for example, weresubstantially higher during the 1990s, after theSAPs were instituted, than during the 1980s, whenprice controls and subsidies were in effect (Heineyand Mwangi, 1997). The SAPs and higher inputprices have therefore reduced the profitabilityof using fertilizer to increase the production offoodgrains for domestic consumption.

The Way Forward

Plant Nutrient Application

Fertilizers need to beapplied at the level required for optimal cropgrowth based on crop requirements and agro-climaticconsiderations(Smaling and Braun, 1996). Balanced application of fertilizers should also include secondary nutrients and micronutrients,both of which are often most readilyavailable from organic fertilizers such as animaland green manures.Lastly, balance is necessary for sustainabilityover time. Coupled with other complementary measures,effective nutrient and soil management can help toreclaim degraded lands for long-term use in somecases. Heavy fertilizer applications on moderatelydegraded soil can not only replenish nutrients, butcan produce about 7 tons per hectare of maizeand about 6 tons per hectare of grain straw, whichlong-term studies in Iowa have shown canincrease organic matter content in the soil (Ange, 1993). Experiments in Ghana and Niger havedemonstrated that

by increasing the longevity andproductivity of suitable agricultural land, the applicationof inorganic and organic fertilizer reducesthe need to cultivate unsustainable and fragilemarginal lands (Vlek, 1990).

Untapped Nutrient Sources

According to Tandon (1992), if used appropriately, the recycling of organicwaste from urban to rural areas is a potential,largely untapped, source of nutrients for farm andcrop needs, especially on agricultural lands nearurban centers. For example, environmentallyundesirable wastewater has been used to irrigatefields and return nutrients and organic matter to the soil. Like organic manure, urban waste is a source of primary nutrients, although a relatively poor source when compared with commercial fertilizers. Stabilized municipalwaste customarily contains about 3.3 percentnitrogen, 2.3 percent phosphorus, and 0.3 percentpotassium, although some concentrations canreach as high as 10 percent nitrogen and 8 percentphosphorus on a dry weight basis (EPA, 1984).

Actual nutrient content, however, varies widely anddepends on the source of the waste. Urban wastealso has a number of other benefits. Like otherorganic manures, it helps improve soil structure byadding organic matter to the soil. It is also asource of the secondary nutrients and micronutrientsthat are necessary in small quantities forproper plant growth. In addition, urban wastetransforms material that would otherwise be slatedfor costly disposal into a useful farm product.Urban waste needs to be treated carefullybecause it may contain heavy metals, parasites,and other pathogens. The buildup of heavy metalconcentrations in the soil can be cause for concern.

While trace amounts of some heavy metalsplay a critical role in plant metabolism, excessive amounts have reduced crop yields and could bedangerous to public and grazing livestock(Conway and Pretty, 1991). To minimize these risksthe continuous application of urban waste needsto be monitored in order to ensure that heavymetal and overall nutrient concentrations do notreach toxic levels and do not damage the environmentthrough leaching.
One option of controlling urban waste is to compost the waste.Composting concentrates nutrients and helps to kill disease-causing organisms and slow the release ofnitrogen that might otherwise percolate intogroundwater, (Kurihara, 1984). Another option isto use ionizing radiation to kill pathogens in andon food without affecting taste. Despite some publicconcern about the safety of food enhancement, thetechnique is likely to be adopted more in thefuture in order to protect public health, improve theshelf-life of food, and make it more beneficial to applytreated, nutrient-rich urban waste to farmland.

Extension

Farmers, withthe aid of extension services, have to be givenaccess to and choose the most appropriate andcost-effective technologies for their precise circumstances.Farmers also need to participate inthe development of these technologies andbecome knowledgeable about managing soil fertilityand capturing the opportunities offered bytheir diverse environments. Hence, successful soil management programs must strengthen farmers' capacityto learn and shift away from the traditional practice of one-way technology transfer from researcher tofarmer (Deugd, Roling, and Smaling, 1997).

Monitoring will help ensure that an environmentconducive for optimal plant growth and crop yieldcan be established through nutrient applicationand soil restoration. Where practical and available,testing techniques such as plant-nutrient-deficiency diagnosis, plant tissue analysis, biologicalcomparison tests across soils, and chemicalsoil analysis are needed to help the farmer improve crop and soil management. Together,monitoring, testing, and nutrient application recommendationsthat reflect crop needs and soilnutrient levels can enable extension agents to helpfarmers overcome the limitations arising fromharsh agroclimatic and soil conditions.

Participation

Acccording toFranzel and Van Houten (1992), the interaction of farmers, researchers, extension officers, nongovernmental organizations (NGOs),and the private sector involved in the distributionsystem is vital to the proper evaluation and widerdissemination of traditional technologies and thedevelopment and adoption of new ones. Farmersneed to play a more important role in technologydevelopment. Plant breeders, for example, oftenfocus narrowly on increasing yields and diseaseresistance. But farmers have other concerns aswell. In particular, farmers want modern varietiesthat generate high yields for crops with high consumerdemand, save labor and reduce costs, and produce plants that resist drought, pests, and disease. New technologiesshould also take into account the diversity,food security, and other risk concerns of smallholder farmers.

FORESTS

Forests are an important natural resource composed of either high density trees (tree forests), underwater vegetation such as kelp forests, or non-vegetation such as fungi and bacteria. The global area of forest of all kind was approximately 3.4 billion hectares in 1990 but that has reduced by at least one-third due to extensive deforestation under human activity (Freedman, 2014). Africa as a whole leads the list of countries with the highest rate of deforestation; permanent loss of species, soil degradation, and impact of climate change (Naoto, 2006 as cited by Cunningham, 2010).

Forest resources are believed to make a major contribution to the livelihoods of forest-adjacent communities, yet this role is not adequately recognized and incorporated in planning and decision-making processes. Forests however, can also incur substantial economic costs to communities in that the presence of forests and woodlands interfere with other economic activities at the local level.

With Africa accounting for 17% of the world's forests, it's alarming to note that over half of global deforestation is in this continent; and more specifically the highest deforestation being in the tropical dry forests in East and Southern Africa. Kenya for example, is classified among the countries with low forest cover of less than 2% of the total land area. The forest cover lessened by 8% between 198 – 1988, 7% percent in the 1990s and an additional 7% since 2000. Kenya's forests are rapidly deteriorating due to pressure from increased population and other land uses (Jervis, 2009).

Global deforestation has sharply accelerated. It has been estimated that about half of the Earth's mature tropical forests between 7.5 million and 8 million km^2 that until 1947 covered the planet has now been destroyed. Some scientists have predicted that unless significant measures such as seeking out and protecting old growth forests that have not been disturbed are taken on a worldwide basis, by 2030 there will only be 10% remaining, with another 10% in a degraded condition 80% will have been lost, and with them hundreds of thousands of irreplaceable species (Michael, 2009).

The water cycle is affected by deforestation. Trees extract groundwater via their roots and release it into the atmosphere. When part of a forest is destroyed, the trees will no longer evaporate away this water and this will result in a much drier climate. Deforestation reduces groundwater and the content of water in the soil as much as atmospheric moisture. The dry soil results in lower water intake for the trees to extract. Deforestation reduces soil cohesion, so that erosion, flooding and landslides ensue (Rogge, 2009).

Rain water is vital for rain fed agriculture which is attributed to increased agricultural production. The reduction of this therefore is seen to contribute to lower productivity of the latter. Forest conservation should be taken seriously by governments and other stakeholders through encouraging tree planting initiatives with the sole aim of increasing forest cover.

Generally therefore, the activities causing this high level of deforestation include the expansion of agriculture into forest lands, population growth, poverty, high dependence on natural resources for subsistence and income, economic pressures to increase exports of agricultural produce, timber and minerals. Furthermore, the farming areas in sub-Saharan Africa are still being expanded in an attempt to increase yields and due to the rise in population. Without improved agricultural productivity, rising food demand alone will perpetuate deforestation and forest degradation. Most of these problems have tried to be addressed through policies by governments and ministries in individual countries without success. The existing policies have their shortcomings either in formulation or implementation. It's important that new policies are formulated while still trying to close the gaps in the existing ones to ensure the protection of forests.

Existing policies on forests and their major concerns

Generally, existing policies on forests are aimed at ensuring that forests contribute to poverty reduction, assist in creating employment and improve the livelihoods of majority of the population. In specific, the policies are geared towards: ensuring poverty reduction, employment creation and improvement of livelihoods, contributing to sustainable land use through soil, water and biodiversity conservation, and tree planting, encouraging participation of the private sector, communities and other stakeholders in forest management to conserve water catchment areas, encouraging farm forestry to produce timber, fuel wood and other forest products, promoting dry land forestry to produce fuel wood and to supply wood and non-wood forest products, enhancing forest extension to enable farmers and other forest stakeholders to benefit from forest management approaches and technologies and the promotion of

forest research, training and education to ensure a vibrant forest sector (Ndiritu, 2009). The main challenge affecting these policies is their application and/or implementation. Basically this is embedded in the poor planning and management of the policies and institutions charged with their formulation and implementation.

Governance

The forest sector has been characterized by ineffective regulatory mechanisms and inadequate law enforcement. Many Forests Acts that have been formulated have geared towards forest governance in the hope of bringing considerable change. The specific areas addressed in natural resource management have been public participation, community and gender rights, equity in benefit sharing and the need to increase the area under forest cover among others (Ministry of Environment, Water and Natural Resources in Kenya, 2004).

Majorly, the challenges here have been implementation since the forest land is still very much on the decrease. Furthermore, public participation means that forestry development has to expand into private and community land. This needs incentives and clear methods of engagement to encourage investments in commercial forestry on private land. Lack of these incentives and methods to engage has led to the failure of these laid-down measures.

Transparency and Accountability

The main constraints in this area relate to making information on forest resources, their use as well as related revenue streams available both internally within the governing institutions and externally to the wider public in a way that ensures transparency and accountability. The institutions that are supposed to implement the policies have created a bad image of the former with continued allegations of corruption and mismanagement of the forest resources. Availability of reliable information is a precondition of the functioning of the licensing/concession system of forest plantations in a way that creates the conditions for the markets to operate efficiently, and ensures that the governments involved get the best possible sustainable returns from the commercial use of the plantations.

Weak Forest Acts

The Forests Acts created at local level forest management institutions are weak and the financial incentives which will enable them to develop their capacity are yet to be defined. As a consequence, the institutions are forced to use a significant share of their resources in monitoring and law enforcement activities. The institutions are forced to organize multiple trainings as a way to cover the gaps left by the weak laws by ensuring their personnel have adequate information on forests. These trainings put further financial pressure on the institutions and increasing their dependence on donor aid. A critical issue is also to define how extension and trainings should be organized without increasing the financial burden. In this regard collaboration with Civil Society Organizations (CSOs) and the agricultural extension services could provide a more sustainable institutional path.

Quality of Forest Administration

Majority of the countries in Sub-Saharan Africa have one major institution that manages the forest resources. However, other institutions, especially at the local levels, are increasingly involved as partners and co-managers. For example, in Kenya, the creation of Kenya Forest Service in (KFS) was one of the major institutional innovations ofthe Kenya Forests Act (2005) to move the sector reform process forward. However, despite its importance, the process of establishing KFS is still incomplete withmost staff working under inferior working conditions, and this is having a negative impact on staff morale. These institutions end up losingtheir key managers which affects the quality of their administration.

The move towards a more decentralized way of managing the forest resources in collaboration with community forest associations and local governments has for long been proposed in many countries but the process for a long time remains in its initial stages; many critical elements of the process remain undefined, and the capacity of these newly established structures remains weak. The role of the major institutions vs. other actors in the management of the forest resources remains still somewhat ambiguous and some current and/or envisaged tasks (e.g. law enforcement and extension) need rethinking given the financial burden they present to the forest service.

Remedies for the existing policies and the proposal of new policies focusing on planning and management of natural resources

Priority actions

The most urgent actions to move the governance reform process forward in the short-term involve fast trackingthe revision of Forest Policy and/or Acts to establish a clear direction and basis for the continued implementation of the

sector reforms. Key issues, that need to be addressed include: establishing the rules for the sharing of revenues between the different forest institutions, establishing the rules for access and use rights of local communities concerning the forest resources and avoiding regulatory overreach in legislating on these. Guaranteeing public information disclosure on forest resources and their use, including related financial flows to ensure that the public (including all sectors of the society) has sufficient information to fully participate in the sector and to monitor the developments is also important to increase transparency and community participation.

Quality of administration

To improve the basis for sustainable forest management, Kenya needs to develop a commonly agreed definition for forests, as well as agree on the Criteria and Indicators for sustainable forest management. This is urgently needed especially as KFS, together with development partners, is now intensifying the work on natural forest assessments, and assessments of trees outside of forests. This is also indispensable for the development of standards for SFM, and to move towards independent forest certification based on a national standard. A more systematic way of monitoring forests and forest activities will also be a necessity, both to improve forest administration and governance, and to respond to the requirements of REDD+. This is closely related to how information management and dissemination is handled, both within KFS and to the Kenyan public.

Coherence of Forest Legislation and Rule of Law

The Forests Acts provide a solid foundation for the forest sector reform process. Effective enforcement of the Forests Act requires addressing both internal factors within the forest sector and external ones. Challenges remain to maintain the cost of enforcement at acceptable levels, to ensure that the actions do not disproportionally target poverty-driven illegal activities and to implement effective institutional cooperation e.g. with the police and judiciary. Eventually, more of the enforcement activities will need to be taken care of by the local-level actors which will require that sufficient incentives are in place (e.g. through revenue sharing). Resolving undefined property rights; where land adjudication processes are not complete, or where community rights are unclear - is also a prerequisite for effective law enforcement.

CONCLUSION

From the discussion it is evident that natural resources play a critical role in sub- Saharan Africa or in any geographical location therefore the need to plan and manage them at all cost. This then requires an integration of all the stakeholders involved for impacts to be realized. In Kenya for instance, the central government needs to closely work with county governments, Non-Governmental Organizations (NGOs), local communities and other interested parties in ensuring that all natural resources are planned and managed accordingly. Collaborations can be created among different countries and regions to try and borrow a leaf from the other party on how to plan and manage natural resources. These collaborations could involve regular visits among parties involved to learn from each other.

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