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PLANNING AND MANAGEMENT OF NATURAL RESOURCES: A CASE OF SUB-SAHARAN AFRICA

Ngocho, E., Kyalo, J.N. and Muli, D.

Jomo Kenyatta University of Agriculture & Technology, P. O. Box 62000-00200, Nairobi

Correspondence: engocho@gmail.com, 0712024098, justykyalo@gmail.com, 0722461624, mulanimuli@yahoo.com, 0720443803

Citation:

Ngocho, E., Kyalo, J.N. and Muli, D. (2015). Planning and Management of Natural Resources: A Case of Sub-Saharan Africa. In: Isutsa, D. K. (Ed.). *Proceedings of the First International Research Conference held from 29th to 31st October, 2014 in Chuka University, Chuka, Kenya, 117-125 pp.*

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 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: ensuring increased per capita water availability above the international benchmark of 1000 m³, 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 policies 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 contamination in 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 wind gusts may also damage plants through both lodging (which causes plants to fall over and die before harvest) 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). Severe erosion may create gullies that interfere with farm machinery use. It also leads to the conversion of land to lower-value uses, or its temporary or permanent abandonment. Off-farm erosion can lead to 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 economic and other

pressures often make it difficult for farmers and their families to efficiently manage the soil for long-term profitability and sustainability.

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

Insecure and crumbling tenure arrangements also contribute to declining soil fertility. Communal rights to graze land without any effort to maximize long-term returns have led to serious overgrazing, which is reported to be the main cause of human-induced degradation in Africa. Ill-defined property rights and insecure tenure rights have also reduced the incentive for farmers to undertake soil fertility-enhancing investments. Secure tenure arrangements can help induce investment in soil fertility to reap the long-term reward of sustained high crop yields and greater profits.

The effects of declining soil fertility on yield growth are particularly visible in Africa, where the most serious food security challenges exist and lie ahead (Badiane and Delgado, 1995). The low level of chemical fertilizer use, decline in soil organic matter, and insufficient attention to crop nutrient studies contribute the most to the loss of soil fertility in the region (Kumwenda et al., 1996). In comparison to the rest of the world, fertilizer use in Sub-Saharan Africa is low and declining. In 1996, Sub-Saharan Africa consumed only 1.2 million tons of fertilizer, (equivalent to 8.9 kilograms per hectare of arable land). By comparison, global fertilizer use reached approximately 135 million tons in 1996, equivalent to 97.7 kilograms per hectare (FAO, 1998 and 1999).

Fertilizer use would probably be even lower if foreign aid were not available. More than half of the nitrogenous, phosphate, and potash fertilizer consumed in developing Africa is imported in the form of aid. In 1990, 22 of 40 Sub-Saharan Africa countries received all their fertilizer imports as aid (Fertecon, 1993). High import prices contribute to the low level of fertilizer use in Sub-Saharan Africa. High fertilizer prices arise from small procurement orders (tenders for less than 5,000 metric tons are common), weak bargaining power, and high freight and international marketing costs. When coupled with high transportation costs due to poor infrastructure, the domestic prices of chemical fertilizer are such that one kilogram of nitrogenous fertilizer can cost the typical African farmer between 6 and 11 kilograms of grain, compared with 2 to 3 kilograms of grain in Asia (Heiney & Mwangi, 1997).

Continuous cropping and erosion reduce the level of soil organic matter (Woomer et al., 1994). Low-input systems can maintain and enhance soil organic matter through crop rotation and intercropping, the application of animal and green manures, fallowing, and reduced tillage (Kumwenda et al., 1996). But as pressure on land and crop intensification increase, these options do not remain practical. The adoption of intercropping and crop rotation technique is often constrained by the extent of land and technology available and by the lack of knowledge about optimal management techniques.

Government Commitment to Agriculture and Structural Adjustment

Although agriculture is increasingly recognized as the engine of economic growth in Sub-Saharan Africa, the level of government commitment to it is low. The lack of competition and heavy government regulation, along with structural factors such as inadequate institutional and physical infrastructure and underdeveloped research and extension systems, have often made fertilizer distribution systems inefficient 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.

SAPs seek to reallocate resource use in order to improve economic efficiency and social welfare. Among other things, the programs have devalued exchange rates, the immediate effect of which has made imports such as fertilizers more expensive, which in turn has often increased farmers' costs markedly. Nitrogen-to-maize price ratios in Ghana, Tanzania, and Zambia, for example, were substantially higher during the 1990s, after the SAPs were instituted, than during the 1980s, when price controls and subsidies were in effect (Heiney and Mwangi, 1997). The SAPs and higher input prices have therefore reduced the profitability of using fertilizer to increase the production of food grains for domestic consumption.

The Way Forward

Plant Nutrient Application

Fertilizers need to be applied at the level required for optimal crop growth based on crop requirements and agro-climatic considerations (Smaling and Braun, 1996). Balanced application of fertilizers should also include secondary nutrients and micronutrients, both of which are often most readily available from organic fertilizers such as animal and green manures. Lastly, balance is necessary for sustainability over time. Coupled with other complementary

measures, effective nutrient and soil management can help to reclaim degraded lands for long-term use in some cases. Heavy fertilizer applications on moderately degraded soil can not only replenish nutrients, but can produce about 7 tons per hectare of maize and about 6 tons per hectare of grain straw, which long-term studies in Iowa have shown can increase organic matter content in the soil (Ange, 1993). Experiments in Ghana and Niger have demonstrated that by increasing the longevity and productivity of suitable agricultural land, the application of inorganic and organic fertilizer reduces the need to cultivate unsustainable and fragile marginal lands (Vlek, 1990).

Untapped Nutrient Sources

According to Tandon (1992), if used appropriately, the recycling of organic waste from urban to rural areas is a potential, largely untapped, source of nutrients for farm and crop needs, especially on agricultural lands near urban centers. For example, environmentally undesirable wastewater has been used to irrigate fields 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 municipal waste customarily contains about 3.3 percent nitrogen, 2.3 percent phosphorus, and 0.3 percent potassium, although some concentrations can reach as high as 10 percent nitrogen and 8 percent phosphorus on a dry weight basis (EPA, 1984).

Actual nutrient content, however, varies widely and depends on the source of the waste. Urban waste also has a number of other benefits. Like other organic manures, it helps improve soil structure by adding organic matter to the soil. It is also a source of the secondary nutrients and micronutrients that are necessary in small quantities for proper plant growth. In addition, urban waste transforms material that would otherwise be slated for costly disposal into a useful farm product. Urban waste needs to be treated carefully because it may contain heavy metals, parasites, and other pathogens. The buildup of heavy metal concentrations in the soil can be cause for concern.

While trace amounts of some heavy metals play a critical role in plant metabolism, excessive amounts have reduced crop yields and could be dangerous to public and grazing livestock (Conway and Pretty, 1991). To minimize these risks the continuous application of urban waste needs to be monitored in order to ensure that heavy metal and overall nutrient concentrations do not reach toxic levels and do not damage the environment through 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 of nitrogen that might otherwise percolate into groundwater, (Kurihara, 1984). Another option is to use ionizing radiation to kill pathogens in and on food without affecting taste. Despite some public concern about the safety of food enhancement, the technique is likely to be adopted more in the future in order to protect public health, improve the shelf-life of food, and make it more beneficial to apply treated, nutrient-rich urban waste to farmland.

Extension

Farmers, with the aid of extension services, have to be given access to and choose the most appropriate and cost-effective technologies for their precise circumstances. Farmers also need to participate in the development of these technologies and become knowledgeable about managing soil fertility and capturing the opportunities offered by their diverse environments. Hence, successful soil management programs must strengthen farmers' capacity to learn and shift away from the traditional practice of one-way technology transfer from researcher to farmer (Deugd, Roling, and Smaling, 1997).

Monitoring will help ensure that an environment conducive for optimal plant growth and crop yield can be established through nutrient application and soil restoration. Where practical and available, testing techniques such as plant-nutrient-deficiency diagnosis, plant tissue analysis, biological comparison tests across soils, and chemical soil analysis are needed to help the farmer improve crop and soil management. Together, monitoring, testing, and nutrient application recommendations that reflect crop needs and soil nutrient levels can enable extension agents to help farmers overcome the limitations arising from harsh agroclimatic and soil conditions.

Participation

According to Franzel and Van Houten (1992), the interaction of farmers, researchers, extension officers, nongovernmental organizations (NGOs), and the private sector involved in the distribution system is vital to the proper evaluation and wider dissemination of traditional technologies and the development and adoption of new ones. Farmers need to play a more important role in technology development. Plant breeders, for example, often focus narrowly on increasing yields and disease resistance. But farmers have other concerns as well. In particular, farmers want modern varieties that generate high yields for crops with high consumer demand, save labor and reduce costs, and

produce plants that resist drought, pests, and disease. New technologies should 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 km² 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 of the Kenya Forests Act (2005) to move the sector reform process forward. However, despite its importance, the process of establishing KFS is still incomplete with most staff working under inferior working conditions, and this is having a negative impact on staff morale. These institutions end up losing their 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 tracking the 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 disproportionately 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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