Sustainable Forest Management in a Changing Climate
FAO-Finland Forestry Programme – TANZANIA

Fire Management Policy and Institutional Review

Dar es Salaam
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Executive Summary

(i) Sustainable natural resources and ecological management is a priority of the government of Tanzania. Forest is one of more valuable natural resources in Tanzania. It is estimated that in 2005, Tanzania mainland had 35.3 million ha of forests, representing 39.9% of total land area (FAO, 2009). While forest claims substantial portion of land surface in Tanzania, the annual value of forest goods and services is estimated at USD 2.2 million, which is equivalent to 20.1% of Gross Domestic Product (GDP) based on 2006 figures. Despite the significant contribution of forest to GDP and people's livelihoods, Recent statistics shows that natural forest cover has been deteriorating from 41,345ha in year 1990 to 37,262 in 2000, 35,215 in 2005 and 33,188 in 2010 (FAO,2010).

(ii) Fire is identified to be one of the major deforestation causes. Other causes of deforestation include; consumption of forest products, encroachment and clearing for agriculture. According to Archibald et al (2010) the fire affected area in Tanzania is about 12% yearly in 2001 to 2007, ranking fourth within the SADC region. Some efforts have been made through Participatory Forest Management (PFM), Integrated Fire Management (IFM) and Community Based Fire Management (CBFiM) but lack of specific policies and institutional frameworks to address the problem of fire have compromised the effectiveness of fire management in Tanzania.

(iii) A review was carried out to assess the history of fire policies, the state of current fire policies and institutional framework. Content analysis was conducted on policies, laws and by-laws so as to identify coverage on fire issues. A desk review was conducted to assess the status and practices of fire management activities and related institutions in Tanzania

(iv) Results showed that fire is not significantly covered by existing policies and acts, many related sectors neither commits resources nor programmes for fire management. Many local governments have no laws or policies to address the fire problem, thus, limiting their capacity to protect natural resources. The formulation and implementation of by-laws have been plagued with a number of problems, among them that the bylaw formulation process is slow and inefficient.

(v) The Tanzanian Government should put in place a fire management policy and as a result establish a clear institutional framework for fire management

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1 Introduction

Sustainable natural resources and ecological management is a priority of the government of Tanzania. The Five Year Plan of 2011 mentions that Tanzania's' rich ecological resources need to be preserved and utilized in a sustainable manner. One aspect, which counts towards a sustainable environment, is the effective management of fire for the forest and land based resources.

It is estimated that in 2005, Tanzania mainland had 35.3 million ha of forests, representing 39.9% of total land area (FAO, 2009). The main forest types are the extensive Miombo woodlands in lowland areas across the central and southern parts of the country, the acacia woodlands in the northern regions, the coastal forest/woodland mosaic in the east, mangrove forests along the Indian Ocean coast, and closed canopy forests on the ancient mountains of the Eastern Arc in the east, on the Albertine Rift and Lake Tanganyika in the west, and on the younger volcanic mountains in the north (MNRT, 2009).

While forest claims a substantial portion of land surface in Tanzania, the annual value of forest goods and services is estimated at USD 2.2 million, which is equivalent to 20.1% of Gross Domestic Product (GDP) based on 2006 prices. The forest sector provides about 3 million person-years of employment per annum (MNRT, 2008). Employment is provided through forest industries, government forest administration and self-employment in forest related activities

Despite the significant contribution of forest to GDP and people's livelihoods, Recent statistics shows that natural forest cover has been deteriorating from 41,345ha in year 1990 to 37,262 in 2000, 35,215 in 2005 and 33,188 in 2010 (FAO,2010). This is a deforestation rate of almost 1% annually. According to FAO (2011) between 1990 and 2010, Tanzania has lost an average of 403,350 ha or 0.97% per year. In total, between 1990 and 2010, Tanzania lost 19.4% of its forest cover, or around 8,067,000 ha. Fire is claimed to be one of the major deforestation causes. Other causes of deforestation include; encroachment, clearing for agriculture and consumption of forest products. According to Archibald et al (2010) the fire affected area in Tanzania is about 12% yearly for the period 2001 to 2007, ranking fourth within the SADC region. Other countries with heaviest burning include Angola, the southern Congo, Zambia and northern Mozambique (SEEN, 2006). According to FAO (2009) fire burned area constitutes an average of 15ha per every 1000ha in Tanzania. This implies that forest fire has large negative impacts on forests and will cause more and serious environmental damage if they remain un-managed. Fire has significant harmful impacts not only to the environment, but also the livelihood of the people in affected areas. The incidence of fire has linkages to climate changes which are projected to affect Tanzania's economy and livelihoods drastically (URT, 2011).

Lack of specific policies and institutional frameworks to address the problem of fire are regarded as critical causes of ineffective management of fire in Tanzania. Most local governments have no fire related laws or policies to implement, thus, limiting their capacity to protect natural resources. The formulation and implementation of by-laws have been plagued with a number of problems, among them that the bylaw formulation process is slow and inefficient (Green, 1995, Mniwasa and Shauri, 2001).

In order to ensure that Tanzania's natural resources; forest, grassland, wildlife resources, water sources and land are not affected by wildfire, there is a need for fire management policy and institutional framework. Either sector policies should contain statements and directives addressing the problem of wildfire or refer to policies that do. Some policies such as the forest policy, beekeeping policy and wildlife policy contain some fire management statements. However the practices of fire management are not

effectively addressed by most ministries (FAO-Fin, Field Report, 2012) and due to this there are critical questions which need to be addressed.

The threshold question is;

 (i) How much is fire a problem to the environment and livelihood of Tanzanians?

The Fire Baseline being developed by FAO-Fin IFM TZ will begin to answer this question. Fire is accepted as being a problem in Tanzania and the policy and institutional framework questions then are:

 (ii) How well do land based sector policies and acts address fires and wildfires in Tanzania?
 (iii) What are the policy gaps?
 (iv) What could be policy options or suggestions for updating the policies? and
 (v) What could be the effective institutional framework to address fire in Tanzania?

This document therefore aims at addressing these key questions and identifies recommendations for fire management and its contribution to sustainable natural resource management in Tanzania.

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2 Methodology

2.1 Fire Policy History

- A desk review was conducted to review the history of fire policies in Tanzania. Content and trend analysis was used to survey the fire management activities in Tanzania from pre-colonial, colonial and post colonial periods.

2.2 Current Fire Policies

The review of current fire content analysis was carried out through documents and sectoral policies namely; forest, wildlife, beekeeping, agriculture and livestock, environmental and land. The analysis was extended to Acts in the respective sectors so as to assess the consistency between policies and Act. Analysis was also made to assess the effectiveness of by-laws made by local government authorities in respect of fire management.

2.3 Institutional Analysis

The analysis on the fire related institutional framework involved again a content analysis of documents which describes institutional arrangements on fire management in Tanzania. The methods of data collection were multiple to enable 'triangulation' among and between them. The methods were; (i) desk review on the current institutional arrangement on fire management activities (ii) in depth interview with sectors ministries policy and institutional set up experts (iii) in depth interview with Local Government Authorities fire related experts (iv) discussions and inputs from the National Task Force for Fire Management in Tanzania.

The information collected relates to policies, acts, institutional structures and regulations which have been set up to guide fire management activities, or fire related elements, in Tanzania. The involved Ministries include; (i) Vice President's Office- Environment Division, (ii) Prime Minister's Office- Disaster Management Department (iii) Prime Minister's Office – Regional Administration and Local Governments (iv) Ministry of Agriculture Food and Cooperatives (v) Ministry of Livestock Development (vi) Ministry of Natural Resource and Tourism (vii) Ministry and Land and Settlements Development and (viii) Tanzania Meteorological Agency.

The analysis framework for institutional arrangement on fire management from related government Ministries, Departments and Agencies MDAs in Tanzania is described below.

The criterion (Issue) considered were:

(i)   fire management policy,
(ii)   fire management legislation,
(iii)   fire management plans and/or programmes,
(iv)   fire management department/section and
(v)   fire management personnel, have been included in the ministries operations.

Each criterion was assessed by applying a numeric value (score):

0 = zero (0) aspects covered

1 = 1 aspect covered

2 = 2 aspects covered

3 = 3 aspects covered

4= 4 aspects covered

5= 5 aspects covered

3

3 History of Fire Policies in Tanzania

The forest management policies and changes in Tanzania can be traced in three periods namely pre-colonial, colonial and the period after independence. In this paper, the pre-colonial period is regarded as the period from where people started agriculture and settled in clans and chiefdoms up to the time of colonialism. Time of colonialism period started in the late1880s to 1961 when Tanganyika got its independence, with the independence period starting in 1961 to the present.

3.1 Forest Fire Policies during Pre-colonial Period

There is scant information on the state of the environment, forest management (Ylhäisi, 2003) and on policy for the pre-colonial times in Tanzania (Holmes, 1995). This period, was characterized by forest and land management through traditional institutions, low populations and minimal natural resources exploitation. People lacked technological capacity and markets to over exploit natural resources and thus their impact on the environment in general was low (Malimbwi and Munyanziza, 2004).

In Tanzania, as in other African countries, forest land was owned communally before colonialism and people used forests extensively for their livelihoods. The forests were sources of food, medicines, clothes, water and a place for spiritual activities (CFA, 2007). Hunting was a fundamental activity for many cultures as it contributed significantly to the community's food supply. Management and use of forest resources was controlled through customary institutions including beliefs, taboos and customs. According to Malimbwi and Munyanziza (2004), some of African societies, local leaders were instituting management practices including issuing permission for trees to be cut for specific purposes (Grundy, 1990). Small scale commercial exploitation of forests and woodlands for timber in Tanzania was not common and customary laws were effective in management of forest and lands including fire.

3.2 Forest Fire Policies during Colonial Period

Exploitation of forests and woodlands in and fire burning in Tanzania started to intensify during the colonial rule of Germany (1891-1914) and then the British (1920-1961). During colonial rule there were policies that limited local people from benefiting from natural resources and gave priority to foreigners (Misana et al., 1996). Colonialists were also against traditional land use practices, which were regarded as detrimental to the forest and environment in general. The colonial government came up with the first Forest Policy in 1953. This policy established protected areas (Ministry of Natural resources and Tourism, 1998), which restricted local people's access to the natural resources upon which they depended for their livelihoods (Pendzich, 1994; Ylhäisi, 2003). In turn the colonial government cleared indigenous forests to establish tea, coffee and exotic fruit and timber plantations. All this was done through extensive burning which in a real sense mark the starting point of forest fire problem in Tanzania.

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3.3 Post Independence Period

3.3.1 Post Independence (1961-1967)

The background of effective fire policies can be traced from the post independence period. Tanzania, then named Tanganyika, gained independence from the British in December 1961, under the guidance of the Nationalist Party the Tanganyika African National Union (TANU). One year later, Tanganyika became a one party state and Republic with an elected President. In 1964 Tanganyika and Zanzibar united and formed the United Republic of Tanzania (Omari, 1985). Cliffe (1972) and Iliffe (1971) noted that, Tanzania was a poor country, at her independence, in 1961 the poorest country among Eastern Africa states.

Tanzania adopted its first vision to achieve independence. Every Tanzanian understood and accepted that independence goal, which was a basic human right. Having attained independence, it was realized that not everybody understood his or her consequent obligation; namely, "enjoying the fruits of independence implied hard work". Hence, the post-independence catchword "Uhuru na Kazi" was adopted. The catchphrase intended to exalt the importance of hard work in realizing the development which was championed in the struggle for independence (URT, 2000). Under this philosophy of "Uhuru na Kazi", the Government of Tanzania put a high priority on poverty alleviation. Together with ignorance and disease, poverty was considered to be one of the three "enemies of development". Several development frameworks were adopted towards a major growth strategy in 1962 with a large focus on agriculture intensification, natural resource management and industrialization (Mtatifikolo, 2001).

The first Tanzanian National Forest Policy was drawn up in 1953 and reviewed in 1963. The policy dealt with the tree and forest resources of Tanzania, management of forests and how they should be used to meet the needs of the nation and of society. The 1963 policy was based on analysis of the "ecological and economic needs of the country and availability of human and other resources" (Ministry of Natural resources and Tourism, 1998), and it was broadened to include all wood and non-wood based forest activities and to included all forest users from villagers to industries. One emphasis of the Forest Policy of 1963 is that of management which in turn included fire management.

3.3.2 Forest Fire Policies under Socialism and Self Reliance (1967-1980)

In 1967, Tanzania adopted the second national Vision in the Arusha Declaration. The declaration articulated a philosophy of socio-economic liberation based on socialism and self-reliance as the long-term national goal of Tanzanians. The Declaration was accepted by the majority of Tanzanians and galvanized them behind its realization. Since 1967, the development vision of Tanzania as well as the policies for social and economic transformation have been guided by the principles and programmes enshrined in the Arusha Declaration (URT, 2000).

During this time (1967 - 1980), the Tanzanian economy was governed by policies of self-reliance. These included extensive compulsory villigization (ujamaa), nationalization, state ownership of assets and direct involvement by the state in productive activities and price controls. Management of natural resources such as forests was included in this approach. During this period Tanzania experienced short-run growth, followed by a long-run economic downturn. By the 1980's Tanzania was the world's second poorest country in GDP per capita terms. At the same time, its natural resource base became noticeably

threatened (Brylinsky and College 1997). The depletion of forest resources and burning increased as in 1970's, Tanzania adopted a strategy to ensure food and crop export production by large-scale production-oriented agricultural parastatals. This strategy, combined with ujamaa, disrupted traditional resource uses and accelerated mass land clearing, burning and deforestation. At this particular period there were no specific policies or acts addressing fire, but rather using ujamaa policies people were relocated from their customary land into planned village settlements during operation Vijijini causing significant disruption of customary management systems of natural resources (Banyikwa, 1991).

Moreover, most of the established villages had formal registrations, but individual village members lacked title deeds, a situation, which also increased the insecurity over village land and forests. This insecurity of tenure has resulted in a number of environmental problems including promotion of open access regimes, particularly in forests and woodlands.

During this period legal institutions had low capacity to deal with dynamics in land and forest issues in Tanzania until the 1980s (Kessy, 1998). This situation plus the global economic reforms forced Tanzania to shift from command to market economies (Nhantumbo et al., 2003).

3.4 Economic Reforms and Fire Policies in Tanzania

By the mid-1980s, the Government of Tanzania had realized that the past development policies and strategies were not adequately responding to changing market and technological conditions in the regional and world economy and also not adapting to changes in the domestic socio-economic conditions (Wangwe, 2009).

In response, beginning mid-1986 to 1995, the Government of Tanzania adopted socio-economic reforms (SER). These were the first in a series of strategies implemented after the economic turmoil of the 1970s that explicitly incorporated the IMF Stabilization and World Bank Structural Adjustment Programmes as part of the conditionality applied. The adjustment and reform aimed at restoring stabilization and growth in the country (World Bank, 2001).

However, notably in the period 1981-1985, Tanzania tried its own structural adjustment programs under the name of National Economic Survival Program (NESP) in 1981-1982 and the Structural Adjustment Program (SAP) in 1983-1985.

Such economic reforms underlining the free market economy included, among other issues, growing interest in sustainable forest management. This brought changes in policies with significant shift in thinking towards development of participatory natural resources management processes. This has often been accompanied by political decentralization or devolution of responsibilities and provision of community involvement in forestry (Petersen & Sandhövel, 2001; CFA, 2007).

During this period, although not directly, the Tanzanian government addressed forest fire challenges through various policies; Agriculture Policy (1997), Land Policy (1995), Forest Policy (1998), Wildlife Policy (1998), Village Land Policy (1999) and the National Development Vision 2025 (Petersen & Sandhövel, 2001). However still there was serious deforestation and damage caused by fire and the absence of a fire management policy persisted (FAO, 2011).

3.4.1 Forest Fire Policies and Poverty Reduction Strategies in Tanzania

In 1998, UNICEF called a World Summit to discuss new dimensions of poverty in Copenhagen. The summit came up with New Poverty Agenda, which saw inclusion of the social aspects of poverty (Temba, 2005). In respect to Copenhagen Summit resolutions, World Bank and IMF introduced Poverty Reduction Strategy Papers to all Highly Indebted Poor Countries (HIPC) to guide countries efforts towards poverty reduction (Semboja, 2005). Tanzania, as a member of HIPC countries, adopted World Bank and IMF directives of adopting poverty reduction strategies. In 1998 National Poverty Eradication Strategies (NPES) were developed and followed by National Development Vision 2025. In 2000 Tanzania adopted the three years (2000-2003) Poverty Reduction Strategy as a medium term strategy to implement national vision and NPES.

Tanzania's first Poverty Reduction Strategy Paper (PRSP) (Tanzania 2000) made little mention of the importance of the environment and natural resource base as the primary building blocks in any efforts to reduce poverty. The most recent poverty reduction strategy (PRS), locally known as MKUKUTA, more clearly recognized the contribution of natural resources to poverty reduction efforts and has mainstreamed environmental issues. The 1998 Forest Policy also breaks new ground by explicitly recognizing the contribution made by forests to poverty reduction and human welfare. However, while the importance of forests is recognized as an asset, fire management as an issue integral to sustainable forest management has not been to date (URT, 2006)

Faced with forest degradation problems, Tanzania introduced a Participatory Forest Management (PFM) regime, first piloted in Babati district in early 1990s (Wily, 1997). This regime was adopted by the National Forest Policy (URT, 1998) with legal support of the Forest Act of 2002 (URT, 2002). PFM has two arrangements namely; Joint Forest management (JFM) and Community Based Forest Management (CBFM). Under the National Forest Management Programme local communities can be involved in the management of forests, and fire management became one important issue of the programme (Ministry of Natural Resource and Tourism, 2009).

4

4 Current Fire Situation and Fire Policies

4.1 Impact of Fire

In Tanzania fire has significant impact on forest resources as well as on other types of land based resources. Tanzania has a total of 33.5 million hectares of forests which are prone to fire burning. It is estimated that wildfires burn an estimated 65,000 ha of forests and other wooded areas annually (Aloo, 2001). Forest fire is a very prevalent disturbance in Tanzania's landscape with several hundred million hectares of vegetation burning every year. According to Archibald *et al* (2010) the fire affected area in Tanzania is about 12% yearly in 2001 to 2007, ranking fourth within the SADC region. Tanzania has about 33.5 million hectares of forests and it is estimated that forest fires destroy about 65,000 hectares of forests and other wooded areas annually MNRT, (1998). FAO (2011) reported that between 1990 and 2010 Tanzania lost an average of 403,350 hectares of forest or 0.97% per year due to fire.

The Fire Baseline Report (FAO-Fin, 2012) shows that fire has positive and negative impacts. The positive impact is realized when fire is controlled. The experience of Tanzania shows fire has largely negative impacts. Fire have serious negative impact as if it is uncontrolled may cause changes in productivity and population structure of a species (Zolho, 2005).Forest fires reduce plant biomass and litter, thereby altering the energy, nutrient and water fluxes between the soil, plants and atmosphere. These changes in turn may affect the long term nutrient status and productivity of the system and consequently population structure of a species, the composition of communities and ultimately, the probability and characteristics of future fires (Frost and Robertson, 1977).Fire also kills animals that are unable to escape or avoid excessive heat and smoke (Frost, 1996). The ranges that have burned are habitats for different species with restricted home range. Herbivores and birds are also specifically affected by fire through changes in their habitat (used for cover, shelter and structure and breeding conditions), food supplies and increased risk of predation due to loss of vegetation (WCS, 2009). The effect of fire frequency on the vegetation is mostly related to its impact on the soil, water, atmosphere and their interconnectedness. Also frequent fires reduce woody plant densities, and can influence changes of floristic and structural composition by killing or suppressing individuals in the smaller diameter size classes (Zolho, 2005).

Figure 1 below indicates the fire events from year 2003 when there were 112,732 recorded and in 2010 when there were 103,122, with variation between years. Tanzania ranks fourth for fire events within the SADC region (Archibald et al, 2010).

Figure 1: Total Number of Yearly Events of Fire in Tanzania
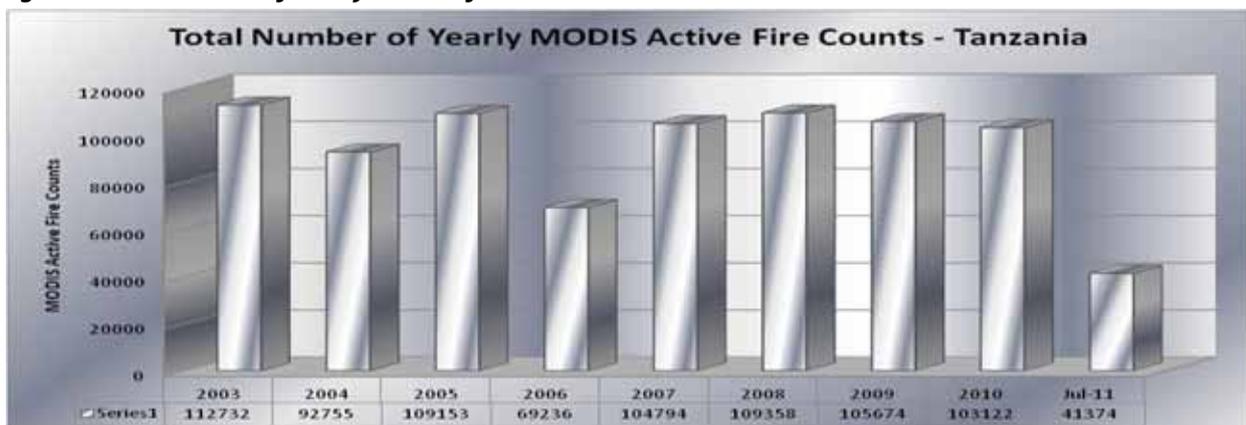
4.1.1 Spatial Distribution of Fire Events

Fire events vary spatially in Tanzania. The most affected region is part of Rukwa which recorded 16 % of all fire events detected by satellite in Tanzania followed by Kigoma with 11%, Tabora with 10% of fire events in Tanzania and Ruvuma, and Morogoro with 8% and 6% respectively (University of Maryland, 2011).

Figure 2: Spatial Distribution of Fire by Regions in Tanzania
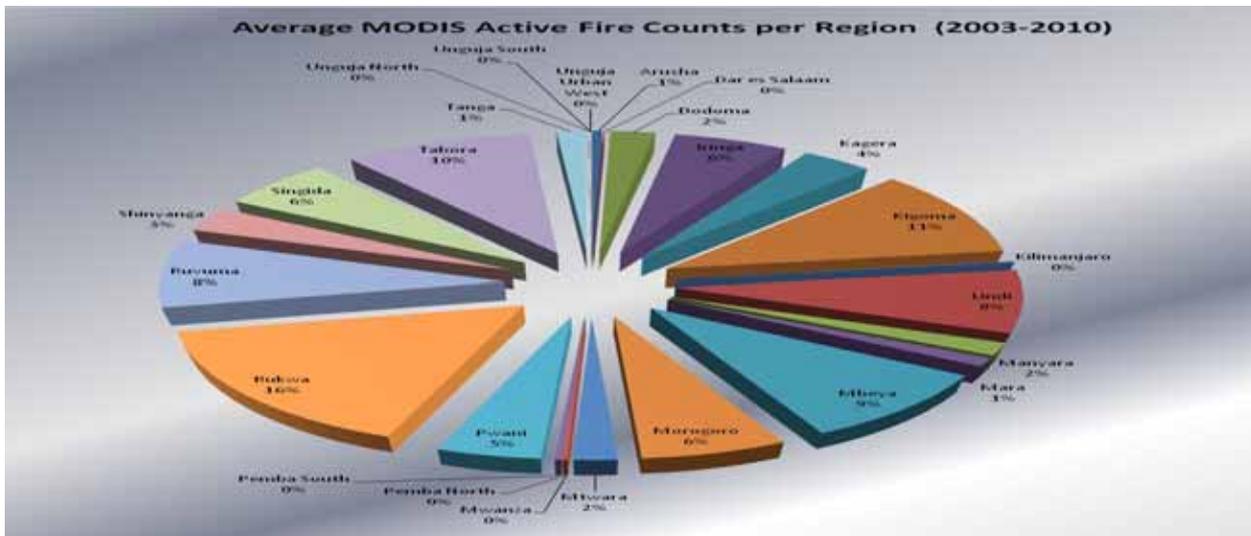
4.2 Policy Response to Fire

In response to the problem of fire in Tanzania, currently each natural resource management sector; forestry, agriculture and livestock, beekeeping, wildlife, land and environment, has a separate sectoral management policy and separate management Act and most often, these policies and acts differ widely on fire issues.

In order to put into implementation these policies, Tanzania has adopted various programmes including participatory forest management strategies, sustainable agriculture programmes, sustainable pasture management programmes, sustainable beekeeping projects, community forest management and joint forest management. In combination these efforts seek to control deforestation, promoting instead forest conservation, sound fire management and improving livelihoods of rural Communities (Yanda, 2008).

Evidence from the ground and reviews of activities and projects related to these programmes identifies that the strategies have had mixed results, with some positive examples that demonstrate success. After more than a decade of programmes significant challenges remain. This implies that efforts on fire management are still needed and depend on a healthy policy environment and management guidelines (Nssoko, 2009). There is a necessity to pave the way for the fire affected and responsible sectors to identify and work on policy based constraining factors which jeopardize the effectiveness of fire management in Tanzania. The sectoral stakeholders need to sit together to review their sectoral policies and acts in relation to fire in order to come up with harmonized cross-sectoral national fire management policy settings and related legislation (MNRT, 2001). Therefore this section identifies and reviews entry points which can be used for fire management policy discussion in Tanzania. A content analysis was undertaken of the selected sector policies and acts by identifying policy objectives and statements which address fire and highlight some deficiency of policies in respect of fire.

Field investigation through interviews and discussion was made to measure the intensity and influence of policies for managing fire. The reviewed policies and Acts include; The National Forest Policy of 1998 and Forest Act of 2002, Wildlife Policy (1998) and Wildlife Conservation Act of 1974, The Beekeeping Policy (1998) and Beekeeping Act (2002), National Environmental Policy (1997), The National Agriculture and Livestock Policy (1997) and respective Acts, and National Land Policy of 1999 and Land Act of 1999.

4.2.1 The National Forest Policy of 1998

Mandate

The National Forest Policy of 1998 is the current policy (under review) which guides forest management in Tanzania (URT, 1998a). The policy mentions fires as one of the threats to public lands leading to their degradation. The policy identifies that wild fires are taking place annually affecting both natural forests and plantations. Wildfires are hampering natural regeneration resulting in eventual deforestation. However, there is a lack of systematic management, unclear boundaries and inadequate resources for fire management. The policy therefore emphasizes clear ownership on land and trees, allocation of forests and their management responsibilities to villages, private individuals or to the government as a way to curb forest degradation caused by among other things, forest fires (URT, 1998a: Policy Statement 5).

Focus and intent

The National Forest Policy focus is on sustainable conservation of forest resources, and seeks to achieve its policy goal of "enhancing the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of natural resources for the benefit of present and future generations". This also involves fire management initiatives as important part of sustainable forest resource conservation.

Fire management in the Forest Policy is not separately stipulated, but mentioned in a group of threats along with appropriate interventions such as developing forest management plans and co-management approaches.

Consistent with laws

The Forest Policy of 1998 is consistent with Local Government Act No. 7 of 1982 which spells out the roles of district and village governments, and provides new levels of autonomy and devolution to local councils which include environmental management. The Village Land Act No. 5 of 1999 confers responsibility for village land management and adjudication in lands to elected village councils. The National Forest Programme of 2001 provides a strategic framework for implementation of forest sector policy, and stresses the roles of stakeholders from the public, private and voluntary sectors. The policy is also in line with Community-Based Forest Management Guidelines of 2002 issued by Ministry of Natural Resources and Tourism. Again it is consistent with the Forest Act No. 14 of 2002. The Forest Act number 14 (2002) has sections 70 – 76 devoted for fire issues and provides for restrictions on burning of vegetation.

On the other hand sections 49-64 of the Act provide permission for social and economic activities in the forest reserves. The Act gives the minister power to allow activities to be undertaken including

- (a) fell or extract timber: (i) for and local for domestic commercial use and sale; (ii) for export; (iii) for mining purposes; or (iii) for prospecting and for exploration of mineral resources;
- (b) gather and take away specified forest produce;
- (c) pluck, pick, take parts or extracts of any protected plant for purposes of research or the production or manufacture of any medicine or other product;
- (d) erect buildings or other structures;
- (e) operate sawmills and such other industrial processes and machinery as may be prescribed;
- (f) construct roads, bridges, paths, waterways, railways or runways;
- (g) camping, operating tourist facilities and undertaking activities connected with tourism, such as tourism photographic; export such other forest produce as may be prescribed;
- (h) sow, plant or cultivate trees, crops or other vegetative matter;
- (i) enter to hunt or fish;
- (j) allow domestic animals to enter and graze;
- (k) any other activity for which the granting of a permit is specifically required by regulations.

However, such permissions have not mentioned fire burning as one of activities in the forest reserves. Nevertheless, the Act specifies that not all forest land will be permitted with social and economic activities, there some instance were no permission will be granted to some forests areas. Section 52 indicates that permit may be granted subject to such conditions as are calculated to ensure that the permit holder exercises his powers under a permit with due regard to the principles set out under section 3, to any forest management plan applicable to the respective forest reserve. This implies that no permission is given without fulfillment of conditions stated in section 3 which specify the objective of the Act that is the need for assuring sustainability of forest reserves in the country.

Again it is clearly stated that, unless otherwise exempted by an order made by the Minister and published in the Gazette, no person shall, subject to provisions of Section 70(1), within any area of Tanzania Mainland; (a) burn any vegetation on any land outside the curtilage of his own house or compound and (b) willfully or negligently kindle or cause to be kindled any fire which he has reasonable cause to believe may spread so as to destroy or damage any property of another person. The Act requires that any person permitted to kindle any fire must give notice of his intention to burn the vegetation in writing and deliver it by hand or orally. The notice must be effective from the date it was issued and shall state as near as may be the time at which the burning will take place. Where fire lawfully kindled after notice was given spread to other land, Section 71(1) of the Act provides for powers to require other persons to assist in extinguishing the fire.

The Director of Forestry and Beekeeping Division may give order to land owners by written notice to provide proper protection to adjoining land from the risk of fire, and Section 72(1) (a) requires land owners to provide firebreaks on the boundaries of such width as may be specified in the notice and (b) to establish and maintain internal firebreaks. Should the occupier neglect the order, the Director shall carry out the work and the costs involved shall be debited to the occupier of the land. Section 91(1) of the Forest Act No. 14 (2002) explains offences in connection with fires and states that any person who without lawful authority; (a) lights or assist in lighting, rekindles or adds fuel to any fire or cause any of these activities to take place, (b) leaves unattended fire which he, with or without authority has lighted or assisted in lighting or used or rekindled or to which he has added fuel before such fire is thoroughly extinguished; or fails to comply with any lawful order issued to him under Part IX of this Act, shall be guilty of an offence and upon conviction, shall be liable to a fine or to imprisonment or both (URT, 2002).

Implementation success

In order to make the National Forest Policy of 1998 and National Forest Act no. 14 of 2002, the Government developed the Forest Regulations of 2004. The Regulations aimed at operationalizing Policy and Act so as to meet the policy objectives. The prevailing Tanzania forest policy, established in 1998, has enabled community participation in forest management and utilization of forest resources and is an important part of the overall approach to reduce the incidence of forest fires.

The 1998 policy is in contrast to the previous forest policy where the Government used to be custodian of such forests while local communities were barred from using the forest resources (Nssoko, 2009). Field work by FAO-Fin Programme (2012) indicates that many parts of Tanzania still experience harmful impacts of fires around forest areas. The Forest Act clearly sets out the requirements around fires in forested land. The problem of human and financial resources however makes the implementation of the act modest.

Furthermore, the punishment stipulated for the contravention of some sections, is very mild compared to the resulting, negative environmental impact.

4.2.2 Wildlife

Mandate

The Wildlife Policy of 1998 puts emphasis on establishment of Protected Areas (PAs) for the goal of conservation and management of biological diversity. Tanzania has designated a significant proportion of national land area for a Protected Areas network devoted to wildlife conservation. Under the conservation and management of biological diversity, the policy clearly states strategies to achieve this goal, and one is a strategy seeking to minimize the damage caused by wildfires. A second strategy is the use of prescribed fires (burning) for management programs as per PA management plans (URT, 1998b: 3 (Strategy No. xvii and xviii)). The wildlife policy also advocates establishment of Wildlife Management Areas (WMAs) outside PAs with the intention of extending some influence and control on the part of government with respect to wildlife management and interactions with local people and their activities adjacent to PAs. Though it is not specifically aimed at reducing fires originating from public lands WMAs may have that effect.

Focus and Intent

The National Wildlife Policy of 1998 intends to involve communities; villages and private sector in management of wildlife. The policy intends to ensure that wildlife animals and plants are protected and the community engaged in the environmental management of wild areas.

Consistent with Laws

The Wildlife Policy of 1998 is consistent with Wildlife Conservation Act No. 12 of 1974 (Section 9 (1)). The Act prohibits burning of bush or grass fire in a game reserve except by and in accordance with the written permission previously sought and obtained of the Director. If any part of the game reserve is included in the forest reserve, the Director of Forestry or his duly authorized representative permission is also required from them. In the same Section part (2) it emphasizes that any person who contravenes Section (1) shall

be guilty of an offence and shall be liable on conviction to a fine not exceeding TAS 5,000 or imprisonment for a term not exceeding two years or to both fine and imprisonment.

Implementation Success

As part of implementation the Ministry of Natural Resources and Tourism –Wildlife Division has Fire Management Plans for each park. The idea of the plans is to ensure that Wildlife sub sector uses prescribed fire and suppresses all fires that are not prescribed. Fire Management Plans are implemented through trained personnel and legal instruments. There is promising progress on the extent of fire management in wildlife areas, but some incidents of wildfire are still experienced in Wildlife Protected Areas. These are mainly caused by animal hunters and poachers. A major handicap to forest fire management, is poor forest fire records which should highlight the location of the incident, time and day of occurrence, causes of the fire, and financial losses and impacts incurred.

This data would provide a foundation for the design and prioritization of future wildfire management activities at the District level and inform strategies at regional level and policy at national level. The establishment of policies and procedures for reporting and recording fire occurrence at sub-village, village, ward, district and national levels will also support villagers in the planning process through having clear data supported descriptions of fires. With planning informed by data may come improved sourcing of funds, infrastructure, training and human resources that will contribute to sustainable fire management.

4.2.3 The Beekeeping Policy (1998) and Beekeeping Act (2002)

Mandate

The National Beekeeping Policy mentions fire as one of the major threats to honey bee colonies which are important in production of quality honey. The use of fire for honey harvesting is discouraged. The policy emphasizes the establishment of community based beekeeping reserves for maximum protection of bees and their habitats.

Focus and Intent

The overall goal of the beekeeping policy is to enhance contribution of beekeeping sector to the sustainable development of Tanzania and the conservation and management of her natural resources for the benefit of present and future generations. In section 4.4.1 it is indicated that one of the policy objectives is to put in place measures to address fires that damage bee colonies. The policy acknowledges the negative impact of fires on beekeeping and the natural resources the sector relies on.

Consistent with Laws

The Beekeeping Policy of 1998 is consistent with the Beekeeping Act No. 15 of 2002 and prohibits burning within gazette bee reserves under Section 17 Subsections 1(a) and (h). Section 44(2) states that any person who uses open fire to harvest apiary products commits an offence and upon conviction shall be liable to a fine of not less than 50,000 TAS and not exceeding 200,000 TAS or to imprisonment for a term not exceeding six months or to both such fine and imprisonment.

Implementation Success

In previous times traditional beekeeping was one of critical agents of fires in Tanzanian forests. Over recent years the beekeeping sub-sector, similar to other sectors, has started to make considerable efforts on management of forest resources in Tanzania; including identification of modern methods, training beekeepers reduced use of fire in beekeeping activities (MNRT, 2009). This provides a promising environment for reducing impact of fires in forest areas, however more intervention are needed to continue to improve the situation.

4.2.4 National Environmental Policy (1997)

Mandate

The National Environmental Policy (NEP) of 1997 advocates for the formation of environmental committees to coordinate natural resources management at the regional, district, ward and village levels. As indicated in paragraph 104 of the NEP, environmental committees "shall be responsible for coordination and advising on obstacles to the implementation of environmental policy and programmes, promoting environmental awareness; information generation, assembly and dissemination on the environment relating to district, ward or village". The Policy identifies six major environmental problems as: loss of wildlife habitats and biodiversity, deforestation, land degradation, deterioration of aquatic systems, lack of accessible, good quality water and environmental pollution.

All these have resulted in land degradation. The policy further explains that poor agricultural practices such as shifting cultivation, lack of crop rotation practices and land husbandry techniques exacerbate the problem. The policy does not treat fire as an environmental problem on its own but it seems to be combined with other factors resulting to land degradation (URT, 1997a). Many of the environmental problems noted can have fires as a factor or cause.

Focus and Intent

The overall objective of the environmental policy is to provide guidelines, plan and give guidance to determination of priority actions and provide for monitoring and regular review of policies, plans and programmes. It further provides for sectoral and cross-sectoral policy amongst sectors and interest groups and exploits synergies among them. Objective 18 (a) indicates that the policy intends to ensure sustainability, security and equitable use of resources for meeting the basic needs of present and future generations without degrading the environment or risking health or safety. The objective 18(b) indicates that the policy aspires to preventing and control of degradation of land water, vegetation and air which constitute our "life support system".

Consistent with Laws

The Environmental Policy of 1997 is enforced through the Environmental Management Act of 2004. The Act grants the power to the Director of the Environmental Division, Vice-President's Office, to direct and guide all country initiatives on environmental management, implicitly including fire management. The Act does not note fire management explicitly but in section 14 it is indicated that there shall be the Director of Environment and such other officers as may be necessary for proper discharge of the functions of the office of the Director of Environment, so an officer with fire responsibilities could be appointed. On

matters pertaining to the management of the environment, the Director of Environment shall among other thing coordinate various environment management activities being undertaken by other agencies and promote the integration of environment considerations into development policies, plans, programmes, strategies and projects.

The Director is also required to undertake strategic environmental risk assessment with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of the quality of human life in Tanzania. Fire as one risk to the environment, but also a natural force, could be considered as part of environmental risk assessments.

Implementation Success

In order to make effective implementation of National Environment Policy, Tanzania established environmental committees to coordinate natural resources management at the regional, district, ward and village levels. However, there is very little recorded by environmental committees in terms of achievements in Tanzania in relation to fire management.

4.2.5 National Environmental Policy (1997)

Mandate

The Agriculture and Livestock Policy of 1997 asserts that agriculture operates in a delicate natural environment which requires proper management and protection. Furthermore it recognizes that the incorrect use of land, water, and forests in the production of crops and livestock can have far reaching effects on environmental integrity. Frequent "bush fires", aimed to stimulate the regeneration of pastures, are noted and can result in increased environmental degradation. One of the objectives of this policy is, therefore, to promote integrated sustainable use and management of natural resources such as land, soil, water and vegetation in order to conserve the environment (URT, 1997b: 21(f)).

Focus and Intent

The ultimate goal of Agriculture and Livestock Policy of 1997 is the improvement of the well being of the people whose principal occupation and way of life is based on agriculture. Most of these people are smallholder and livestock keepers, who do not produce surplus. Therefore the focus of this policy is to commercialize agriculture so as to increase income levels (URT, 1997). Objective number 3.2 (f) intend to ensures the promotion of integrated and sustainable use and management of natural resources such as land, soil, water and vegetation in order to conserve the environment. This goal implicitly includes the fire management issues due to the impacts of fire on those natural resources, both positively and negatively.

Consistent with Laws

The Agriculture and Livestock policy of 1997 is consistent with a range of Acts such as; Cotton Industry Act of 2011, Tanzania Cotton Marketing Board Act of 1984, Tanzania Pyrethrum Board act of 1997, Tea Act of 1997, Agriculture Development Fund of 1984, Agriculture Input Trust Fund of 2002, Production development Fund Act of 1974, Sisal Industry Act of 1997, Cashew nuts Marketing Board of 1988, Seeds Act of 2003, Agriculture Products Movement Act of 1965, Fertilizers and Animal Foodstuff Act of 1962, Warehouse Receipt Act of 2005, Food Security Act of 1991, Protection of New varieties Act of 2000 and

Produce Export Act of 2002. The review on these Acts noted that fire management issues are not part of them, which may be a critical gap in the sectoral objectives in respect of fire management in Tanzania.

Implementation Success

Experiences from Tanzania have shown that for successful forest and bush fire management, frequent training and awareness raising to communities is a pre-requisite. Albeit not much have been done with regards to fire management in the agriculture sector (WWF, 2006). There are specific fire management programmes taking place in many villages in Tanzania. This activity suggests that, rural farmers may be lacking training and awareness campaigns on fire management. Some village governments, have rules and regulations and by laws on fire management but they may not well be known to the communities (FAO, 2010).

4.2.6 The National Land Policy of 1999

Mandate

In Tanzania Land Uses are mandated by the National Land Policy of 1997 and the Land Act 1999. Section 4.2.9 of the National Land Act indicates the need for the protection of sensitive areas. Policy statement 4.2.10 outlines the creation of mechanisms for the protection of sensitive areas including among others; water catchments areas, mountains, forests, national parks, national heritage and areas of biodiversity. These areas, or part of them, shall not be allocated to individuals. Section 7.1.0 explains the importance of coordination in land use management. It is stated that before user rights such as for mining, timber harvesting, hunting etc are considered, existing land tenure rights should be recognized. Emphasis is given on the formation of an Inter-ministerial Committee by relevant ministries to ensure consultation between the issuing authorities and the Ministry responsible for lands. Policy statement is given under section 7.2.1 on agricultural land use and puts emphasis on community involvement in resource management, land planning and conflict resolution. The whole issue of land tenure features clearly in the policy and discourages shifting cultivation and nomadic practices which have been always accused of causing forest fires. The protection of sensitive areas and clarity around land tenure and use are underpinning elements of sound fire management.

Focus and Intent

Section 2.0 of the National Land Policy of 1997 indicates that the ideal focus and intent of the land policy is to promote and ensure an effective land tenure system, to encourage the optimal use of land resources and facilitate broad-based social and economic development without upsetting or endangering the ecological balance of the environment.

Consistency with Law

The Land Act of 1999 is consistent with Land Policy as it acknowledges the major principle of the Land Policy of 1997. The principle states that land must be used productively and that any such use should comply with the principles of sustainable development. This implies that the Land Act of 1999 had somehow reflected the insights of National Land Policy, albeit both documents only indirectly address the problem of fire as they have not mentioned fire at all.

Implementation Success

Fire management is one of the concerns of land management in Tanzania. Various initiatives have been directed at ensuring sustainable use of land is made in both rural and urban sectors. Fire management has been part of land use management objectives in Tanzania, however, very little has been done to ensure fire management is incorporated in land use plans and practices in Tanzania.

4.3 Local Government By-Laws and Fire Management Plans

This section provides and discusses the survey results from 11 districts namely; Chunya, Mbozi, Rungwe, Songea Rural, Mbinga, Tunduru, Mikindani, Masasi, Misungwi, Sengerema and Bukoba Rural. The survey showed that out of 11 sets of by-laws collected the policy coverage on fire management issues is not strong; with 7 of 11 (63.7%) identifying the case of tree planting and only 3 of 11 (27%) and 4 of 11 (36%) identifying fire management and fire burning penalties respectively (FAO-Fin, Policy Field Work 2012). This suggests there is no substantial coverage of fire management issues in district by-laws.

The analysis of implementation suggests that tree planting is rated high as a practice by 61% of 82 respondents; practices on fire management noted as high by 52% and Fire Burning Penalties as high by only 20% of respondents. This implies that many districts may not have emphasis on fire management penalties and have not a focus on fire management practices. These results are also supported by the study made by FORCONSULT-SUA 2009 which shows that most of the Central Government, District Council and Community forests did not have by-laws and fire management plans. There appears to be a need for Government and other stakeholders to take deliberate effort to promote and encourage the development of fire management plans at the local level. Table 2 below indicates the linkages between by-laws and actual fire management practices in Tanzania through 11 selected districts.

Table 1: Linkages between by-laws and actual fire management practices

Policy Issue	Policy coverage in by-laws		Actual Implementation			
	Frequency	Percentage	High	Satisfying	Normal	Poor
Tree Planting	7	63%	61%	17%	12%	0%
Fire Management	3	27%	52%	24%	18%	6%
Fire Burning Penalties	4	36%	20%	48%	14%	18

4.4 Policy Issues, Challenges and Gaps

4.4.1 Issues and challenges in current policies

Arising from the analysis on fire policies and study findings, the following issues and challenges for fire management are noted.

- Fire has remained a critical agent of deforestation as Tanzania continues to lose approximately 403,350 ha or 0.97% of its forest reserve annually.
- Generally fire issues are rarely covered in policies and by-laws. Almost all the sectoral policies and sectoral Acts don't deal with wildfire. Only the Forest Act dedicates a section to it. All other

sectoral policies and acts mention wildfire in passing and in some cases as a useful management tool in cleaning up the farms and reactivating forage growth in pasture and lands. The analysis of by-laws indicates that, fires are inadequately addressed at the local level. The problem of fire is still significant at the local level as local communities acknowledge and follow by-laws more than national or sectoral policies. Poor coverage of fire issues in by-laws may mean poor enforcement of fire management strategies and initiatives.

- Many stakeholders (81%) consulted concluded that fire policy is very important, while 78% noted that the policy is very relevant and 61% anticipate very important impact from fire management.
- Insufficient finance is a very strong factor causing poor management of fire, noted by 82% of respondents. Other factors include; low information and publicity noted by 69 % of respondents, absence of policy by 67% of respondents, low community awareness and commitment by 56% of respondents. Enforcement and accountability, and insufficient personnel were noted as high by 33% and 45% of respondents respectively suggesting they were perceived as less influential. Among other factors finance, absence of policy, publicity and information sharing and fire management personnel are issues to be address in order to support fire management in Tanzania (FAO-FIN, Policy Field Work, 2012).

4.4.2 Policy Gaps

Generally, the policies analyzed above, do not explicitly say how fire could best be managed. This is a gap that needs immediate attention if Tanzania is to effectively manage fire at all. There is also no evidence in policies and acts on how the synergies and collaboration with other land use sectors could be achieved. In most cases, sectors have operated independently including those under the same ministry such as the forestry and wildlife divisions. This has diminished the chances of attaining successes in managing and reducing the fires during the dry seasons over the years (Burgess and Kilahama, 2005).

Lack of effective coordination and cooperation amongst the sectors dealing with environment issues has, therefore, led to natural resources management conflicts including failures to address and contain fire in situations where natural ecosystem services are severely disturbed by fires.

In respect of sectors, the following gaps were noted for fire management in Tanzania;

- Fire management in the Forest Policy is not separately stipulated, but mentioned in a group of threats and appropriate interventions such as developing forest management plans and co-management approaches. The Forest Policy does not provide policy statements for fire management apart from recognizing its impact on vegetation. Most forests are under public ownership, and these are open access areas where a lack of land means that they have continued to be burnt due to pressure for land and livelihoods from local people.
- The Forest policy advocates empowering local communities on management of forests but the whole process is heavily donor dependent and this is not sustainable. Empowerment requires government commitment and synergy with other policies such as those of the Land, Agriculture, Wildlife, Beekeeping, Mining and Environment sectors.
- The Forest policy does not provide scenarios on how common land problems are going to be solved in the framework of other related policies. On the other hand the Forest Act has the problem of inadequate human and financial resources to enforce the Act. The punishment stipulated for the contravention of some sections, is very mild compared to the resulting, negative environmental impact.
- The major gap with Wildlife Policy is that the policy does not explicitly say how best fire can be managed or to what objectives. Is fire to be minimized or optimized? The synergy with land use polices is not given and therefore opens room for conflict in a situation where burning regimes differ. Again fire is not given sufficient importance by the Wildlife Act and the punishment is very

slight. A further weakness is that the Act is not addressing fires originating from outside the game reserves which are noted as the main sources of fire in most reserves.

- In the Beekeeping Policy and Act, directives and punishment respectively, are mild and the Act does not address fires originating from outside bee-reserves which are the main causes of fire in most reserves.
- The gap of the National Agriculture and Livestock Policy is that apart from pastureland, fire is not explicitly mentioned in the policy above and beyond land preparation with this use of fire being implicated as one of the main cause of forest fires.
- Although the National Land Policy has puts some insights on the need to protect the environment by outlining the creation of mechanisms for the protection of sensitive areas, nothing has been noted in relation to fire as a significant of agent of destruction for protected areas. A further policy gap in the National Land Policy is that fire is not more explicitly covered as an issue in the policy. More emphasis is needed to expose the policy to wider impact on fire management.
- The Policy Gap in the Local Government Policies, Acts and regulation is that the formulation and implementation of by-laws have been plagued with a number of problems. First, the bylaws' formulation process is slow and inefficient. Another problem is incapacity of the law enforcers in terms of skills to use by-laws and effective monitoring capacity, especially in the rural areas. This is partly due to the lack of modern equipment and up to date legal materials including legislation on environmental management. Additionally most of the environmentally based by-laws are outdated and have inadequate penalties to deter repeat offenders from degrading the environment through fire (LEAT, 2009).

5

5 Institutional Framework for Fire Management in Tanzania

5.1 The Institutional Set up

The prevailing the situation on fire is becoming clearer and initial analysis suggests that Tanzania still lacks an institution dealing specifically with management of fire in the landscape. Institutions dealing with environment, forest, land, natural resources, agriculture, livestock, minerals, disaster management, local government authorities and others are noted as being responsible for fire management in Tanzania (Kilahama, 2011). A related analysis of fire policies and legislation identified that while there were some roles, responsibilities and mandates among the various agencies for fire management the arrangement was not clear, not cohesive and inconsistent. There was little or no interaction identified between the agencies in the past on fire issues even with the potential synergies, overlap and shared boundaries. Very little has been done to evaluate and publicize the roles of such institutions in fire management in Tanzania.

This section provides a review of the existing institutional framework on fire management activities in Tanzania. The intention is to assess the framework of fire management by reference to the institutional arrangements for the administration and implementation of policies, legislation, and regulations relating to fire management in Tanzania.

5.2 Status of Institutional Framework for Fire Management in Tanzania

5.2.1 Inventory of Policies and legal aspects supporting Fire Management in Tanzania

Some sector ministries have some initiatives however, it is noted that very little has been done by the government as a whole with regard to fire management in Tanzania. Table 1 indicates various policies, acts, plans and departments/sections aspects observed from selected sector ministries dealing with fire management in Tanzania. The table suggests that fire is intensively managed by the ministry of natural resources and tourism which scored 5 points in policy, legislation, programmes, department and personnel. The ministry of home affairs scored 4 points as it has fire policy, programmes, department and personnel. Local governments had scored 1 point as some of them had formulated fire management by-laws. Other MDA's such as Land and Settlement, Energy and Minerals, Vice President's Office-Environment, Prime Minister's Office - Disaster Management Department, Agriculture, Food Securities and Cooperatives and Livestock and Fisheries have noted a zero score. This implies that fire is not adequately addressed by many of sectors found in the Tanzania government structure. Notably, as identified in the Fire Policy Review, some ministries have 'fire' combined with other aspects and hence it is not identified specifically. One example is the VPO's Office where "environment" and impacts on it includes fires although there is no section, unit or person with "fire" as part of their title.

Table 2: Inventory of institutional aspects for fire management in Tanzania

Ministries	Fire related policy		Fire Issues in Legislation		Integrated management Programmed	Fire Plan/	Fire management Department/Section		Personnel		Total Scores
	Status	*Score*	*Status*	*Score*	*Status*	*Score*	*Status*	*Score*	*Status*	*Score*	
Natural Resources and Tourism	Covered Forest Policy of 1998	1	Covered in Forest Act of 2002 1	1	Present	1	Public Affairs Department in TFS and Zonal Offices	1	Present	1	5
Land and Settlement	Not present	0	Not present	0	Not present	0	Not present	0	Not Present	0	0
Agriculture	Not Present	0	Not present	0	Not present	0	Not present	0		0	0
Livestock	Not Present	0	Not present	0	Not present	0	Not present	0		0	0
Energy and Minerals	Not present	0	Not present	0	Not present	0	Not present	0	Not present	0	0
Vice President's Office: Environmental Division	Not present	0	Not present	0	Not present	0	Not present	0	Not present	0	0
Prime Minister's Office: Disaster Management Department	Not present	0	Not present	0	Not present	0	Not present	0	Not present	0	0
Local Governments (LGA's)	Not present	0	Covered in few LGAs By-Laws	1	Not present	0	Not present	0	Not present	0	1
Ministry of home Affairs	Present	1	Not present	1	Present	0	Not present	1	Present	1	4

5.2.2 Issues, Achievements and Challenges of the current Institutional Arrangement for Fire

Current efforts in fire management are guided by various sectoral policies, legislation, regulations, guidelines and norms. All these policies are found within related sectors such as agriculture and livestock, mining, environmental, mining, forest, wildlife policies, land. However Tanzania has no independent fire policy. Fire issues are managed separately by respective sectors applying their respective policies. Tanzania has some sectoral elements which can be used to practice fire management independently within each sector. These frameworks can be traced from the ministries level to the regions, districts, wards, and villages (William, 2011). The ideal, however would be to come up with a combined framework which will integrate sectoral efforts toward fire management (FAO, 2011).

Fire management frameworks in Tanzania are characterized by five major issues; (i) absence of fire management policy (ii) the presence of traditional approaches and ability of communities in fire management at the local level, (iii) participatory forest and fire management systems and integrated fire management approaches and (iv) policy reviews and (v) institutional arrangements and reforms. These aspects, if in place, would provide the essential base for formulation of an effective institutional framework for fire management in Tanzania. The description of achievements and challenges of each issue is given in the subsequent sections.

Absence of fire management policy

It has been identified that Tanzania has no overarching fire management policy (Nsoko, 2002). The absence of fire management policy has compromised institutional efforts to combat wild fire in Tanzania (Kilahama, 2011). A study by FAO-Finland Integrated Fire Management Programme (2012) has noted that many of fire management stakeholders accept that the nonexistence of the policy, jeopardizes their initiatives toward fire management. This situation provides a fuzzy climate for setting an effective institutional framework for fire management in Tanzania.

Traditional Approaches and ability of Communities in Fire Management

Tanzania possesses very effective traditional approaches of fire management that have been practiced at the local level for many years. Such approaches include Ngitili, meaning enclosure in the western Tanzania (Kilahama, 1994 and Nssoko, 2002). A study by Kajembe et al. (2009) noted that Tanzania also has best Community Based Fire Management (CBFiM) practices in addition to what is done under the Joint Forest Management (JFM) approaches. Their study was carried out in selected villages in the in southern highlands; the northern highlands with Lugala Mountain Forest in Ikuvilo (non-CBFM) in southern Tanzania as a control. These cases provided the evidence that, Tanzania has useful traditional technologies which need to be taken advantage of and incorporated into, not undermined by, efforts on fire management. Likewise, the institutional framework for fire management in Tanzania should recognize the role of CBFiM.

While CBFiM is useful in Tanzania the major challenge is that, Tanzania has neither strategy nor specific programmes which foster CBFiM. The current local government structure does not provide adequate autonomy to communities. Community based structures are unable to make important decisions independently because many legal provisions make the local government dependent on the Central

Government. The current institutional framework does not provide room for traditional institutions to be recognized and accommodated in the framework in respect of fire management.

Participatory Forest Management and Integrated Fire Management

Tanzania is one of the countries implementing programmes of Participatory Forest Management (PFM) and Integrated Fire Management. IFM can be looked on as a subset of PFM however IFM is also wider in its focus. The IFM looks to the integration of sectoral efforts towards fire management and later facilitates the vertical harmonization from the national to the community level. PFM intends to improve the livelihoods and wellbeing of poor rural communities who live close to or inside forests and woodland areas, an objective that is likely to rely in some locations on CBFiM. PFM was introduced in 1990's with efforts from Denmark, Finland and the Tanzanian Government. Both PFM and IFM can play significant roles in the management and reduction of fire impact in Tanzania. The evidence on PFM indicates that most of areas which practiced it such as Iringa, Mbeya, Shinyanga-HASHI, Dodoma-HADO have achieved considerable results on forest and fire management as a key aspect of the PFM efforts (Blomley and Iddi, 2009).

Another challenge is that PFM and IFM are primarily defined as a strategy for sustainable forest management. Consequently it is not surprising that the resources directed towards PFM and IFM have been targeted at forests, or trees, only and not other land based sectors such as agriculture, livestock and environment more generally. This situation still constrains the need to identify that fire management is a multi-sectoral issue. IFM should be handled in a manner that all related MDAs should be able to access both resources and responsibilities related to fire management in Tanzania.

On-going policy reviews

In the Tanzanian context, consistent with most jurisdictions, a policy is a document which guides plans and actions of the government and even the institutional set up of the government (Baguma, 1993). It is fortunate that recently the Tanzanian Government through MDA's such as; (i) Vice President's Office-Environment Division (ii) Prime Minister's Office-Disaster Management (ii) Agriculture, Food and Cooperative, (iii) Ministry of Natural Resources and Tourism (vi) Ministry of Livestock and (vi) Ministry of Home Affairs-Fire Brigade are undergoing various review of their policies and regulations. It could be useful if such reviews will integrate fire related aspects, thus to ensure that fire management initiatives are well captured at the policy level by related sectors.

The challenging issues here are; (i) Is there a policy formulation framework to guide integration of fire management issues in sectoral policies? (ii) Are related institutions seeing the rationale of fire management aspects in their policies (iii) How can fire management aspects be integrated into sectoral policies? The answers for these questions contrast from one another as it is already noted that Tanzania has neither fire policy nor national guideline (Nsoko, 2002). On the other hand the second question is answered by results from field work by FAO-Finland Integrated Programme (2012) which shows that 81% of 65 respondents selected from various fire related MDAs and LGAs have rated fire policy with high scores to eliminate fire problems in Tanzania. The third question of how to integrate fire issues in sectoral policies will be addressed when Tanzania will achieve a fire policy and develop a clear institutional framework for fire management.

Institutional Arrangements Reforms

It was noted by William (2011), that Tanzania has already a clear institutional framework for management and fire management activities are expected to follow the existing government structure from national-regional-district-division-ward and village level. This structure is very practical as it creates room for fire management and fire related functions to be attended to at each level of administration. This framework has number of shortcoming associated with a range of factors that combine and create an unfavorable environment for management of fire by sectors.

Such factors include;

(i) Resources that exist in fire prone areas and can be damaged or degraded by fire such as forest, grasslands and farmland are highly underestimated. This means that the general public, decision makers and politicians are largely unaware of the considerable wealth that exists, and the potential value that this represents in terms of revenues and economic opportunities from such resources (Milledge *et al.*, 2007). This implies that many institutions do not attach the real value of land base resources and fire impacts on them in that regard. In turn very little is done in setting institutional structures to manage fire in the country. The various sectors have not yet combined their efforts toward fire management in Tanzania.

(ii) Capacity for law enforcement: The most relevant agency on wild fire management is the recently formed Tanzania Forest Service (TFS) under the Ministry of Natural Resources and Tourism. The challenges of TFS are many and are related to finance, expertise, influence on other sectors, lack of participation by stakeholders and other sectors; and the poor quality of information sharing between sectors (MNRT, 2011).

(iii) There is a potentially negative influence under the on-going reforms such as Decentralization by Devolution (D by D), where Local Authorities of Tanzania have been given the primary responsibility for delivery of services in their locality. The central government holds responsibility for the management and protection of national level programmes and resources. The problem is that districts are still highly constrained by human and operational resources, which largely prevent them from effectively implementing the fire management at the local level.

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6

6 Potential for Improvement

6.1 Fire Policy Review

Suggestions which might be considered in order to address the policy review on fire management in Tanzania include:

1. Since fire management is seldom routinely considered by most sectors; the need for identifying the baseline information on fire, development of a fire communication strategy, analysis of the legal framework to support fire management and assessment of community based fire management strategies remain important. These analyses, being undertaken by FAO-Fin, supported as well by the GIZ Trilateral Cooperation Project, will underpin the discussion and progress towards smooth formulation and implementation of fire policy in Tanzania.
2. The need to come up with an overall National Fire Policy for Tanzania has merit and deserves discussion and debate, especially where current policies are ineffective to address fire (Madoffe 1999, Kilahama, 2011 and Nssoko, 2009) and since Tanzania need to address the impact of fires more seriously.
3. There is need for setting up a clear institutional arrangement on fire management. One potential model is to see the Vice Presidents Office-Environmental Division taking full responsibility for coordination of fire management initiatives, not including operations and field control functions.
   a. The Vice President's Office is the overarching institution for formulating environment management policy and the related legal framework in the country. In accordance with Sections 15 and 75 of the Environmental Management Act, 2004, all environmental management issues including climate change are coordinated by the Vice President's Office. This Act mandates the Division to coordinate environmental management issues including fire management. The Division of Environment is therefore the potentially logical focal point for all matters related to fires. There should be a careful analysis to evaluate the Vice Presidents Office, Environmental Division mandate and capacity for taking full responsibility for Fire Management coordination. National Task Force supported by FAO-Fin and GIZ Trico, is working on this assessment and has the major stakeholders such as sector ministries. Fire Management coordination in Tanzania should also include all of the following; Agriculture, Livestock, Ministry of Natural Resource and Tourism, Mining, Prime Minister's Office-Regional Administration and Local Governments, Tanzania Metrological Agency and other MDAs and development partners to collaborate to achieve this important end.
   b. Other options and models should also be evaluated for their suitability and fit to the purpose of national collaboration and coordination of fire management.
4. The government of Tanzania through Ministry of Natural Resource and Tourism is implementing a programme of Sustainable Forest Management in a Changing Climate, with the collaboration of FAO and the Government of Finland, the FAO-Fin Programme. One of the programme components is Integrated Fire Management where fire policy is an important deliverable of the programme (Kilahama, 2011). There is also a trilateral Cooperation Project funded by the Government of Germany in partnership with South Africa and supporting Tanzania on some fire management training, data acquisition and community engagement on fire management. There are also efforts by the VPO, sector ministries, International Organizations, NGOs, and CBOs.
5. Other critical issues include; lack of effective coordination between sectors, equipment availability, finance and human resource to support fire management. Field Work by FAO-Fin (2012) indicates that majority of fire management stakeholders interviewed, 82% of 80 respondents, note inadequate finance as a very strong factor causing poor management of fire. Other factors include; low levels of information and publicity (69 % of respondents), absence of policy (67% of respondents) and low community awareness and commitment by 56% of respondents.

Enforcement and accountability, and insufficient personnel were noted as high factors by 33% and 45% of respondents respectively, suggesting they were perceived as less influential (FAO-FIN, Policy Field Work, 2012).

6. On-going reviews of environment based and sector policies such as Agriculture, Livestock, Forest, Environment and other policy reviews to come should put more emphasis on fire management issues so as to improve outcomes in the field of fire management (Nssoko, 2009).

6.2 Institutional Framework for Fire Management in Tanzania

Previous sections have noted the vagueness of current institutional arrangements for fire management in Tanzania. The critical issues include (i) absence of fire policy (ii) lack of integration between sectors (iii) little attention given to traditional approaches on fire management (iv) low capacity of local authorities to manage fire (v) low coordination of fire issues in the on–going sectoral policy reviews (vi) inadequate resources and personnel for fire management and (vii) fire management aspects are rarely taken into consideration by sectors and on-going programmes such as PFM and many others. When the implementation environment is vague the need for having a clear institutional framework for management of fire in Tanzania is paramount (Sokile et *al*, 2003) so that Tanzania can consistently manage fire and pay due regard to fire aspects in a strategic, engaging and cross-sectoral way.

6.2.1 Introduction

Fire effects are numerous and long lasting and has multiple impacts to various sectors. Therefore its management requires a multi-sectoral approach as a substantial amount of responses are needed beyond the ability of one organisation. To avoid duplication of work it is important to have elaborative structures and assignments to different actors at all levels.

What follows arises from the Inception Workshop on Joint Efforts towards Integrated Fire Management in Tanzania. The workshop was held on September 1st - 3rd 2011 at Morogoro supported by the Government of Tanzania, GIZ and FAO-Fin Integrated Fire Management for Tanzania Project. In that workshop the participants considered in groups what a coordinated and integrated fire management system in Tanzania could look like. A requirement was that all the actors work as a 'system' and can really make a difference at local level. Groups were encouraged to use a diagram and visualize how the different actors would work together and to be as specific and 'concrete' as possible. The key ideas put forward were common to many groups and are collated and described here.

6.2.2 Fire Management Committees

Fire management committees should be in place from national to the village level which will generally coordinate, mobilize funds, guide, direct, approve and control fire management activities at their respective levels.

They could be called National Fire Management Committee, Regional Fire Management Committee, District Fire Management Committee, Ward Fire Management Committee and Village Fire Management Committee. This structure may well be able to be included or added to an existing one, the environmental committees at various levels were identified as one potential host for the fire management roles.

6.2.3 Leading Agencies and National Technical Committee

Leading and supporting agencies could be identified for each type of fire as critical constituency of the Fire Management. They would prepare Standard Operational Procedures (SOPs) developed to meet requirements and commitments of each sector related respective fires. The Fire Management Strategy could describe each agency obligations and responsibilities.

6.2.4 Sectoral Technical Committees.

Technical Committees (TC) will be under respective sectors and shall be responsible for providing technical expertise to a sector specifically on fire in that sector.

6.2.5 Fire Management Units

In each stakeholders office there could be a unit or desk officer identified specific for fire management issues, decided upon, to facilitate monitoring and follow up.

6.2.6 Wild Fire Response Teams

Fire response teams established in areas to respond to fire emergencies and provide input and operational functions for risk reduction and readiness.

6.2.7 Community Level

At Community Level that is, the ward and villages where wildfire occurs and response takes place, Fire Management Committees could be formed and become the "front-line" structure of fire management at the community level. A key feature of this structure (from national to community level) is to ensure effective risk reduction (prevention) and readiness to respond to fires to reduce impacts on lives, livelihoods and the environment.

6.2.8 Private Sector Participation

The Private Sector is endowed with expertise, equipment and funds to supplement Government efforts. As per Public-Private Partnership Policy of 2009, private entities should be invited to collaborate with the Government in all endeavours including fire and risk reduction initiatives. There is a strong case of self interest in respect of many private sector entities such as plantation companies and agribusinesses.

6.2.9 NGOs, CBOs and FBOs

NGOs, CBOs and FBOs have ability to mobilise additional resources, which are useful in supplementing government efforts in planning, prevention and during emergencies and in the recovery from fire events. They have an advantage of being present and effective at community levels. They could be usefully engaged in promoting public awareness, training, provide assistance and fund self-help activities.

6.2.10 The Media.

The Media has a unique and essential supporting role to play for successful fire management. The capacity to properly communicate and inform all stakeholders is crucial in fire planning, prevention and for fire situations when they arise. The media is a potentially valuable source of communication for improved insights and understanding of fire issues, public awareness for fire risk reduction, mobilizing people to participate in planning and prevention and warnings and resources mobilization to support an emergency situation.

## 6.2.11 A potential structure for Fire Management in Tanzania

The National Task Force that was formulated following the Morogoro Fire Integration Workshop in September 2011, was supported through out 2012 by FAO-Fin and GIZ, meeting six times. Among the topics it deliberated on was the potential institutional arrangements for fire management in Tanzania and a combination of the key ideas developed at the Integration Workshop in Morogoro in 2011 were developed and discussed. The current version of a potential structure for fire management in Tanzania follows as Figure .

7

7 Conclusion

Shortcomings noted from absence of fire policy and institutional framework can addressed by the Tanzanian Government and its partners and stakeholders. What is needed is to put in place a fire management policy and as a result establish a clear institutional framework for fire management. With the current efforts of the National Task Force on Integrated Fire Management, Tanzania government is expected to receive advice from the NTF on the options and preferences for locating fire management functions to a formal body mandated to handle environmental issues and fire in particular. This needs to be followed by formulation of a National Fire Management Policy. Other related MDA's are expected to engage in fire management in an integrated manner with the structure that is yet to be considered but in respect of their particular sectoral objectives and responsibilities.

Figure 3: potential structure for fire management in Tanzania
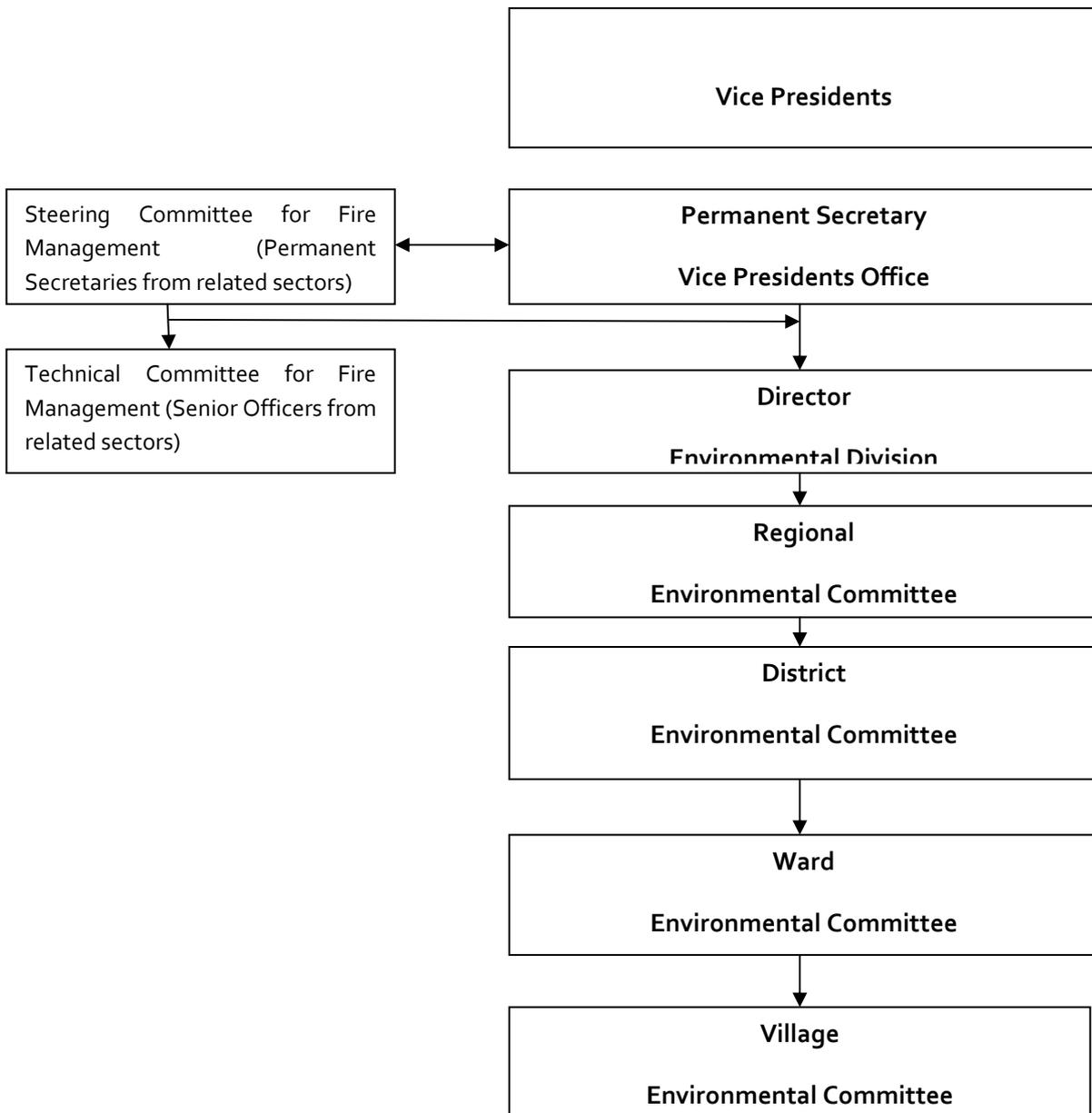
Bibliography

Archibald ,F. , 2010, Fact on World Fires, www.fao.org

Aloo, I. (2001), Forest fires in Tanzania. Lecture notes for MNRSA short course participants. SUA, Morogoro, Tanzania (Unpublished).

Banyikwa, W.F, (1991), Constraints on Sustainable use of Natural Resource in Tanzania. In Malimbwi et al, (2009), Forest land tenure system in Tanzania: An overview of policy changes in relation to Forest Management, ISSN 1891-2281, INA fraggport 14, Norwegian University of Life Science.

Baguma R, (1993), Public policy Making in Tanzania, Uongozi Journal, Institute of Development Administration, Mzumbe, ISSN. 560102

Blomley, T and Iddi,S (2009), Participatory Forest Management in Tanzania: 1993 – 2009 Lessons learned and experiences to date, A report submitted to Forestry and Beekeping Division, Ministry of Natural Resources and Tourism, Tanzania.

Burgess, N. & Kilahama, F. (2005). How much of the Eastern Arc Mountains is protected and what needs to be done to complete the protected area network? *The Arc Journal,* No. 19. TFCG.

Cliffe.L.R (1972) and Iliffe (1971) Towards Socialist Planning, Dar es salaam, Tanzania Publishing House, 1972, pp 94-96. In Komba A.M (2010). Integration of Employment Issues in Development Frameworks, A Research Report submitted to the Ministry of Finance, Tanzania.

FAO (2009). State of World"s Forests. Rome.

FAO-Finland Integrated Fire Management Programme (2012), Review of Fire policies, Field Work Report, Unpublished

FORCONSULT-SUA and TAFORI, (2009), Conservation and Management of the Eastern Arc Mountain Forests Project, Fire Reduction Strategies in Eastern Arc Mountains of Tanzania.

Kessy, J.F (1998). Conservation and Utilization of Natural Resource in East Usambara Forest Resources Conservation Views and Local Perspectives. Tropical Resource Management Papers No.18. In Malimbwi et al, (2009), Forest land tenure system in Tanzania: An overview of policy changes in relation to Forest Management, ISSN 1891-2281, INA fraggport 14, Norwegian University of Life Science.

Kilahama, F .(2009), Integrated Fire Management and Reduced Emissions through Deforestation and Degradation Program (REDD Plus), Keynote Paper presented Director of Forests and Beekeeping Division, Ministry of Natural Resources and Tourism, Tanzania.

Kilahama, F.B. (1994). Trees and Indigenous Ecological Knowledge about Agroforestry Practices in the Rangelands of Shinyanga Region, Tanzania. A Thesis submitted for the Degree of Doctor of Philosophy in Agroforestry of the University of Wales (*unpublished.*). School of Agricultural and Forest Sciences, Bangor, Wales.

Madoffe, S (2009) Forest Protection: A compendium for Sokoine University of Agriculture-Morogoro, Tanzania. (In-house report, Sokoine University of Agriculture, Morogoro, Tanzania

MNRT. (2011), Synthesis Report on Joining efforts towards Integrated Fire Management in Tanzania, Ministry of Natural Resources, Tanzania

MNRT (2008a).Participatory Forest Management in Tanzania. Facts and Figures. Forestry and Beekeeping Division. 13pp . In Blomley T and Iddi, S (2009), Participatory Forest Management Programme in Tanzania, Lessons learned and experiences to date.

Mniwasa E and Shauri, V. (2001) Review of the decentralization process and its impact on environment and natural resources management in Tanzania. Lawyers Environmental Action Team (LEAT), Dar es Salaam, Tanzania.

Mtatifikolo, F. (2001), Implications of Public Policies on Poverty and Poverty Alleviation: The Case of Tanzania. Poverty Alleviation Programme. REPOA Special Papers No.4 Dar es Salaam University Press. In Komba A.M (2010). Integration of Employment Issues in Development Frameworks, A Research Report submitted to the Ministry of Finance, Tanzania.

Milledge, S., Gelvas, I. and Ahrends, A. (2007), Forestry, Governance and National Development: Lessons Learned from a Logging Boom in Southern Tanzania. TRAFFIC East/Southern Africa

Nhamtumbo.I, Monela G.C and Kowero. G (2003). Land Policies in Mozambique and Tanzania: Implications for Forest Development. In Malimbwi et al, (2009), Forest land tenure system in Tanzania: An overview of policy changes in relation to Forest Management, ISSN 1891-2281, INA fraggport 14, Norwegian University of Life Science.

Nssoko, E. 2002. Fire in Miombo woodlands: A case of Bukombe District, Shinyanga-Tanzania. Presented at Communities in flames: An international conference on community involvement in fire management, 25-28 July 2001, Balikpapan, Indonesia. Online: http://www.fao.org/. Visited June 2010.

Rowell. A and Moore P. (1991). WWF/IUCN. Global Review of Forest Fires, Gland, Switzerland. 64 pp

SEEN (2006). Natural Resources and their Management, Information Sheet no.8, Namibia.

United Republic of Tanzania,(1998) Ministry of Natural Resource and Tourism, National Forest Policy.

Sokile, C.S., J.J. Kashaigili and Kadigi, R.M.J. (2003). Towards An Integrated Water Resource Management In Tanzania: The Role of Appropriate Institutional Framework in Rufiji Basin. Elsevier Journal, Special Edition of Physics and Chemistry of the Earth, Part A/B/C, Volume 28, Issues 20-27

URT. 1998. National Beekeeping Policy. Government Printer, Dar es salaam, Tanzania. URT 1999. National Land Policy. The Government Printer Dar es Salaam, Tanzania.

URT. 2002a.The Forest Act, 2002. Government Printer, Dar es Salaam, Tanzania (Part IX and Section 91(a)-c).

URT. 2002b.The Beekeeping Act, 2002. Government Printer, Dar es Salaam, Tanzania (Section 44 (2).

URT. 2002a.The Forest Act, 2002. Government Printer, Dar es Salaam, Tanzania (Part IX and Section 91(a)-c).

University of Maryland, Number of Yearly MODIS active Fires, Courtesy of Hoffman. A, GIZ Tanzania Project (2012)

URT, 2012, National Five Years Development Plan, Government Printer, Dar es salaam, Tanzania

Wangwe, S.M (2009) Political Economy of Tanzania. From Liberalization to Growth with Transformation. Paper presented in 2nd April 2009, Poverty Alleviation Policy Forum, ESRF. In Komba A.M (2010). Integration of Employment Issues in Development Frameworks, A Research Report submitted to the Ministry of Finance, Tanzania.

William. C (2011). The state of community based fire management in Tanzania. FAO- Finland Project. Community Based Fire Management, Forestry and Beekeeping Division, Ministry of Natural Resources and Tourisms, United Republic of Tanzania (Unpublished)

Wily, L (1997).Villagers as Forest Managers and Government:"Learning to let go".The case of Duru-Haitemba and Mgori Forests in Tanzania. Forest Participation Series, Forest and Land Use Programme, International Institute for Environment and Development No.9. In Malimbwi et al, (2009), Forest land tenure system in Tanzania: An overview of policy changes in relation to Forest Management, ISSN 1891-2281, INA fraggport 14, Norwegian University of Life Science.

World Bank (2001).Tanzania Forest Conservation and Development Project. Project Appraisal document, World Bank Washington DC

WWF. 2006, Community Based Fire Management Plan, and B-laws in East Usambara to WWF Tanzania. A Consultancy report submitted to WWF Tanzania Programme Office.

Yanda ,P .(2008). Economics of Climate change in Tanzania, IRS, UDSM, Tanzania.

Ylhaisi, J (2003), Forest privatization and the role of community in the forest and nature protection in Tanzania Environmental Science and Policy, 6:279-290. In Malimbwi et al, (2009), Forest land tenure system in Tanzania: An overview of policy changes in relation to Forest Management, ISSN 1891-2281, INA fraggport 14, Norwegian University of Life Science