

# A review of capacities of public forest administrations for interventions in climate change activities in the dry forest and woodland countries of Sub-Saharan Africa

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## SUMMARY

Public Forest Administrations (PFAs) have been transformed from the ‘policing’ type agencies for forest protection and conservation into modern people-centred institutions applying participatory approaches of forest management. This paper presents an overview of the status of capacity of PFAs and their scope of activities on climate change including stakeholder involvement, access and equitable benefit sharing. Findings indicate that there is a critical shortage of trained personnel to handle the new mandates in order to respond effectively to climate change. Furthermore, PFAs are under-funded and, despite recent shifts in their mandate and scope, they are not prioritized highly in national budgets. In addition, lack of sustainable financing for climate change activities from local and national sources has resulted in most of the funding for forest related climate change activities being funded by external agencies. Consequently, national government PFAs budget increases are imperative. Furthermore, there is an urgent need for local, national and regional initiatives on training and capacity building for PFAs and countries need to elevate the national profiles of their PFAs to be commensurate with the crucial roles forests play in national development.

Keywords: adaptation, climate change, Mitigation, REDD+, sustainable forest management

## Brève vue d’ensemble des capacités des administrations des forêts publiques dans les travaux liés au changement climatique dans les pays à forêts humides de l’Afrique sub-saharienne

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Le travail des Administrations des forêts publiques (PFAs) a évolué de gestion forestière en gestion forestière durable, puis en gestion des forêts et des terres forestières pour les services et les produits de l’écosystème et enfin en atténuation du changement climatique et à une adaptation à ce dernier. L’objectif de cette étude est d’offrir une vue d’ensemble des capacités des PFAs dans les travaux liés au changement climatique. Les résultats montrent que, bien que les PFAs existent encore sous une protection nationale comme du temps de l’ère coloniale, la majorité des pays à forêts humides les ont vu se transformer, passant de la simple mise en exécution d’une protection et d’une conservation forestière à des approches participatives centrées sur le facteur humain. Plusieurs facteurs ont contribué à cette évolution, le principal étant le fait que le secteur forestier actuel inclut un développement durable qui souligne un mouvement vers une utilisation des ressources durables plutôt qu’une conservation «à l’ancienne». Plus important encore est le fait que les PFAs ne sont pas seulement chargées de s’occuper de la foresterie traditionnelle, mais aussi du travail lié au changement climatique au niveau forestier, en réponse à de nouveaux et à d’émergents défis environnementaux. Cependant, les PFAs manquent de capacités physiques, humaines et financières pour mettre leur travail en exécution, et ce, dû à un manque de fonds, car ils ne sont pas une priorité importante dans les budgets nationaux, en dépit du changement de vision. De plus, on observe un manque dans la participation des parties prenantes, un accès et un partage équitables des bénéfices vagues, une capacité inadéquate d’estimer et de faire des rapports sur les inventaires des gaz de l’effet-serre (GHG), et une carence d’application du Guide de bonne pratique (GPG) du Panel inter-gouvernemental sur le changement climatique (IPCC).

## Una revisión de las capacidades de las administraciones forestales públicas para la intervención en actividades sobre el cambio climático en los países con bosque seco del África subsahariana

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Las Administraciones Forestales Públicas (AFP) han pasado de ser agencias forestales de tipo ‘policial’, con miras a la protección y la conservación, a ser instituciones modernas centradas en las personas, que aplican enfoques participativos de ordenación forestal. Este artículo

presenta una visión general del estado de la capacidad de las AFP y el alcance de sus actividades en relación con el cambio climático, como la participación, el acceso y la distribución equitativa de beneficios para las partes interesadas. Los resultados indican que hay una grave escasez de personal capacitado para gestionar los nuevos mandatos con los que dar respuesta de manera efectiva al cambio climático. Por otra parte, las AFP carecen de financiamiento y, a pesar de los cambios recientes en su mandato y su alcance, apenas se priorizan en los presupuestos nacionales. Además, la falta de financiación sostenible para las actividades relacionadas con el cambio climático a partir de fuentes locales y nacionales ha hecho que la mayoría de la financiación de las actividades referentes al cambio climático relacionadas con los bosques estén siendo financiadas por agencias externas. En consecuencia, es imprescindible que los gobiernos nacionales aumenten el presupuesto de las AFP. Asimismo, existe una necesidad urgente de iniciativas locales, nacionales y regionales en materia de formación y desarrollo de capacidades para las AFP y los países deben elevar los perfiles nacionales de sus AFP para que estén en consonancia con las funciones cruciales que desempeñan los bosques en el desarrollo nacional.

## INTRODUCTION

### Dry forest and woodland countries

Dry forest and woodlands, occurring in climates with a dry season of three months or more, are predominantly in the Southern and Eastern Africa and the Sahel regions of Africa. These are characterized by vegetation types dominated by woody plants, primarily trees, and the canopy of which covers more than 10 per cent of the ground surface. Woodlands in Africa are diverse vegetation formations that include woodland proper, bushland, and thicket and, in some cases, wooded grassland (Chidumayo and Gumbo 2010). Furthermore, these forests and woodlands are rich in biodiversity that is important for the supply of ecosystem goods and services which comprise direct use benefits, indirect use benefits and intermediate use services (Chidumayo and Gumbo 2010, Dlamini 2013).

In Southern Africa, the miombo dry forests are predominant and cover 2.4 million ha and span from Mozambique to Angola and include also Southern Tanzania and Southern DRC. These forests play a key role in watershed protection in all countries, but the management of many dry forests and woodland as well as a network of forest protected areas is a major challenge faced by Southern Africa countries. Some International partners are supporting management and protection of some dryland forests in some countries, while the bulk depends on government funding (World Bank 2012). Eastern Africa is composed of countries that are highly diverse, including densely populated and rather humid countries (Uganda, Rwanda and Burundi), and countries with substantial dryland areas (Kenya, Ethiopia and Tanzania). Eastern and Southern Africa countries are broadly forest-poor, though it includes several forested biodiversity hotspots (FAO 2011, World Bank 2012).

There is a need to protect key “water towers” (forested mountains and hillsides) that has reached high political prominence. For instance in Kenya there has been an identified link between forest degradation and reduction in the reliability of flows in the water bodies which constitute the drinking water supplies to Nairobi (FAO 2010a, World Bank 2012). Rwanda has succeeded in reversing deforestation despite very high population densities. This has been made possible by the Rwanda landscape restoration programme which has attracted funding from a variety of sources and is helping to restore fertility, integrate trees in production landscapes,

control erosion, and protect key wetlands while increasing agricultural productivity (FAO 2011, FAO 2012, World Bank 2012). Ethiopia has also invested in landscape restoration, though there is scope to substantially expand the scale by embarking on a large-scale “re-greening” programme as part of a broader green growth strategy (FAO 2012, World Bank 2012). In addition, Ethiopia, Kenya and Tanzania are participating in the REDD readiness process, and all three countries have pilot projects under way supported by the Bio-Carbon Fund (World Bank 2012).

In the Sahelian countries, forests and woodlands cover about 14% of land area while tree cover is sparse for much of this area. Regardless of the pressure on resources, deforestation rates in the Sahel (about 0.8 % per annum) are lower than in most of the other sub-regions (FAO 2011). This is mainly attributed to policy reforms after the droughts and famines of the 1970’s and early 1980’s (World Bank 2012). In addition, countries have enhanced sustainability of their forests through the widespread use of indigenous trees in regeneration programmes. There is therefore great opportunity to take advantage of that and scale up these regeneration programmes further (FAO 2010b, World Bank 2012). Several countries are also supported by community wood-fuel plantations and reforms in the fuel-wood and charcoal market. However, the countries are faced with challenges of low capacity and financial constraints on the implementation of these programmes to scale, but in large part the policies and technologies are in place (FAO 2011, World Bank 2012).

### Public Forest Administrations

Public Forest Administrations in the Sub-Saharan Africa region have evolved since independence, from a centralized to a more decentralized approach towards broad-base participation in forest management ( FOSA 2004, Owino and Ndinga 2004, Dlamini 2007, Geldenhuys *et al.* 2011, Popoola 2013a). In addition, the overall mandate of PFAs has been expanded and complicated by new and emerging challenges. These challenges include: lack of good governance, continuous environmental degradation, alarming loss of biodiversity and degradation of forests, persistent financial crises, slow progress towards attaining Millennium Development Goals (MDGs), climate change, water scarcity, food crisis, energy crisis, imbalanced patterns between consumption and production, other environmental factors, including invasive alien plant species, a succession of disasters, health crises (HIV and

AIDS, TB, Malaria, Hypertension etc.) (UN 2012). There is a perceived profound lack of capacities in the region's PFAs to cope with the new mandates and respond effectively to the current challenges, and in particular the new dimension of climate change work within the context of the overall PFAs programme portfolio. Moreover, climate change work demands new technologies and finance (FAO 2010a).

#### *Review objective*

The objective of this review is to highlight the public forest administration and its link to climate change work and further synthesize available information on climate change work and identify the capacity available to effectively conduct climate change activities in dry woodlands and forests countries of Sub-Saharan Africa.

## PUBLIC FOREST ADMINISTRATION AND CLIMATE CHANGE

### **Type and scope/extent of activities**

In East Africa, a number of countries have established some form of frameworks to address climate change issues. In Ethiopia, an Environmental and Social Management Framework (ESMF) has been formulated and developed and linked to the REDD+ activities. In addition, a proposal for monitoring, reporting and verification (MRV) systems was initiated in relation to nationally appropriate mitigation actions (NAMA). In Kenya the national climate change response strategy proposed the creation of a dedicated climate change secretariat at the Ministry of Environment and Mineral Resources with stakeholders from various government sectors, non-governmental organizations, UN, and other related development agencies (Kakuru 2013). In this regard, activities included the completion of the REDD+ Preparedness Proposal, the setting-up of the national steering committee, the appointment of 16 technical Working Groups, the formulation of the climate change policy, and the on-going processes of mainstreaming the climate change policy to other relevant national policies and integrating climate change into government plans and budgets. While there is no formal institutional framework in place in Rwanda, the infrastructure exists related to forestry and climate change at the National Meteorological Services and the Agriculture Research Institute of Rwanda. Somalia has not signed the UNFCCC or the Kyoto Protocol, and has no (Environmental Impact Assessment) EIA policy and legislation (Kakuru 2013). However there is recognition and use of the IUCN EIA Guidelines by the Somalian Natural Resources management Programme. In South Sudan, there is a REDD+ programme with a corresponding National REDD+ Strategy to implement the programme. Tanzania's National Development Framework (Vision 2015) embraces biodiversity and forest ecosystems, adaptation and mitigation issues, and a low carbon development pathway under all processes. The country also has a REDD+ strategy and MRV of REDD+. Whilst in Uganda a REDD+ preparedness proposal has been developed and the

Uganda National Biomass study conducted by the National Forestry Authority has addressed the UNFCCC requirements (Kakuru 2013).

Addressing the linkages between Agriculture, Forest, and Land Use (AFOLU) and Reduced Emissions from Deforestation and Degradation (REDD) is being advanced under the African Climate Solution (COMESA-EAC-SADC 2011). Fundamental to this integrated approach is recognition of the dynamic inter-action between standing forests, forest buffer zones and forest-agriculture lands. As part of the COMESA-EAC-SADC initiative on Climate Change Adaptation and Mitigation, southern African countries (SADC) have developed Climate Response strategies and Agriculture frameworks such as the National Adaptation Programmes of Action (NAPAs) and CAADP investment frameworks (Kakuru 2013).

From the policy perspective, management of forest resources and other natural resources in southern Africa is governed by a regulatory system consisting of several acts and policies (Kayambazinthu *et al.* 2003). Much of this legislation in southern African countries has been reviewed and improved over the past twenty years ((Geldenhuys *et al.*, 2011). The underlying principles of these policies are to achieve efficient, profitable, and sustainable management and utilization of forest resources by all. Southern African Development Community (SADC) Protocol on Forestry signed by all members consolidates these principles of natural and forest related policies. A recent synthesis of the scope of on-going climate change work includes the Germany funded community-based management of indigenous forests project in Botswana, Malawi, Mozambique and Namibia looking at systems to monitor forests and carbon (Makano 2012).

The Sahelian region has a great potential for REDD+ which recognizes indigenous and local people. For example, a liberal model that promotes community-based enterprise development and sustainable natural resources management is the Rural Wood Markets in Niger, Mali and now in the other Sahelian countries (Box 1).

### **Stakeholder participation**

According to Dlamini (2012) and Kakuru (2013), in East Africa and Southern Africa, most stakeholders are not fully involved in policy formulation, development, implementation, and monitoring and evaluation. Hence the need for integration in decision making is lacking in forest management and climate change activities. Furthermore, the involvement of women, youth and vulnerable groups in forest-based climate change programmes, projects and activities at local level remains a major challenge in these regions. In the SADC and COMESA regions there are strong protocols for the involvement of major groups in forestry development, but practically there are no interventions towards enhanced involvement of these stakeholders in forestry processes in national, regional and international forums (Dlamini 2012).

Except, for a few new concepts such as the rural firewood markets, the Sahel region has been known for its excessive control on access of local communities to forest resources

**Box 1: The rural wood markets model  
(Niger and Mali and other Sahelian countries)**

The rural firewood markets are perceived as a major step forward in Sahelian sustainable natural resource management and community-based enterprise development. After decades of failed, or highly disappointing, forestry projects and programmes, the rural wood market concept has opened a new way forward and created possibilities for a wide variety of initiatives. This model is people-centred and consequently empowers local people, putting the critical responsibility of local natural resource management with those who stand to gain, or lose, most from it. In addition, the markets are also making a significant contribution to the overall processes of decentralization and democratization taking place in the Sahelian countries. This concept gives a local community formal control over its own area of natural forests and woodlands and exclusive rights to the sale of all the firewood produced from it. In return, the village signs an agreement to manage the woodland sustainably. Public Forest Administrations are responsible for ensuring compliance with signed management agreements, best practice, and policy and legislation. PFAs further resolve potential conflicts between local communities and non-resident collectors of forest products from other communities.

*Source: Foley et al. (2002).*

which led to their limited participation in forest utilization and subsequent management activities. In Gambia for example, as recent as 2006 only 18,000 ha were under community forestry, but now there is an aggressive initiative to promote participatory forest management concept, aimed at transferring 200,000 ha of forest land to local communities by 2019 (Popoola 2013a). Consequently, the level of participation of stakeholders and local communities in forest policies and legislation processes and their implementation vary from country to country in this region.

**Measures and incentives for stakeholder participation**

In East Africa, broad-band participation in forest and climate programmes, projects and activities is being promoted through creation and provision of economic incentives for forest conservation and farm forestry, and other related activities. In addition the involvement of government, youth, women, private sector and vulnerable groups requires their proper placement for participation in value chains for forest products. The involvement of NGOs in forestry in East Africa has resulted in enhancing the participation of civil society in forestry. According to Kakuru (2013) in Kenya, for example, some measures to increase community stakeholder participation involve: encouraging sustainable use of forest resources by communities, supporting the establishment of community forests for conservation and management of forests, protecting the traditional interests of local communities in proximity to the forests, recognising cultural practices that

are compatible with sustainable forest management, and recognition of marginalised groups especially youth and women in forest conservation and strategies through training and education opportunities in forest management of forests.

In southern Africa, Dlamini (2012) and Makano (2012) have highlighted the mechanisms that would improve the participation of a broader stakeholder group in the region including the following:

- Implementation of relevant articles of the SADC FANR Protocols on Forest Governance and Trade, the SADC Forest Protocol (2002), the SADC Forestry Strategy (2010–2020), The SADC Regional Biodiversity Strategy, the SADC Regional Fire Management Programme (2010), and the SADC REDD+ Programme (2011),
- Implementation of relevant sections of the COMESA Forestry Strategy and Action Plan (2012);
- Initiatives for advocacy and mobilization at national level for equitable representation in forestry and climate change decision making forums;
- Improvement of transparency, accountability and stakeholder participation in decision making, and policy and legislation formulation and implementation,
- Supporting women involved in conservation agriculture;
- Data and information gathering and institution building at national level;
- Initiation of input subsidy programmes to boost agriculture, agroforestry, conservation farming, Afforestation and reforestation programmes;
- Prioritising policy issues and interventions related to forestry and climate change, and
- Strengthening of Forestry Colleges, community based natural resources management initiatives and trans-boundary natural resources management interventions.

In the Sahel region, Bihibindi (2013) highlighted strategies for improving and enhancing participation in forest and climate change activities in the Sahel including, development of policies that promotes and acknowledges the roles of different roles players in public forests administration and climate change, and establishment of forest institutions/forums for knowledge sharing in order for policy reviews and development of forest projects and programmes.

**Equitable benefit sharing**

The valuation of ecosystem services has been at the heart of the United Nations Convention on Biological Diversity which called for the conservation of biological diversity, sustainable use of its components and the fair and equitable sharing of benefits arising out of utilisation of genetic resources (UNEP 1992: AMCEN 2011).

Forest products in the East Africa region involve a complex value chain with a number of actors including harvesters, transporters, local, regional and international traders and consumers or resource users (Kakuru 2013). Moreover, these actors are guided by clear governance systems and procedures, which however have some challenges regarding

equitable benefit sharing. Nonetheless, access and equitable benefit sharing is central in the region's forestry sector as a strategy and a tool to foster commitment by the custodians of forests (Mvondo 2012 and Kakuru 2013). Currently, non-resident collectors and traders of forest resources benefit more than the local people. Mechanisms for equitable benefit sharing are being formulated and finance is essential in all these processes. For example, Tanzania has established a good model for benefit sharing from REDD+ (Mvondo 2012).

Similarly, in southern Africa, Dlamini (2007 2013) and Makano (2012) suggested that people derive their sustainable livelihoods from natural forests and woodlands. Local communities benefit from direct benefits, indirect benefits and intermediate use services of the adjacent natural forests and woodlands. However a more structured approach to community-based enterprises would add value to forest products and increase the benefits to local communities, traders and resource users/consumers. The introduction of participatory forest management and REDD+ models has enhanced the potential of maximising benefits for local people.

In the Sahel region, Bihibindi (2013) revealed that the limiting factor to benefit sharing is the stringent controls on access and harvesting and utilization of forest resources. This has led to exacerbated illegal extraction of forest resources which has in turn had a negative impact on equitable benefit sharing amongst forest stakeholders. In this regard, REDD+ which recognizes indigenous and local people has great potential to address this. An example of a liberal model that promotes community-based enterprise development and sustainable natural resources management is the Rural Wood Markets in Niger, Mali and now in the other Sahelian countries (abdou 2013).

## CAPACITY OF PUBLIC FOREST ADMINISTRATIONS IN CLIMATE CHANGE

### Capacities of public forest administrations

Kowero and Spilsbury (1997) conducted a study to investigate the capacity of institutions in forestry related research in the SADC region. These results clearly showed that countries in the southern and eastern Africa region faced serious capacity and budget challenges in forestry related activities.

Recent studies in most countries in East Africa show that PFAs in terms of trained personnel have been established and are well equipped. However, the national budget allocations for forestry development are not sufficient and therefore hinder the full realization of implementation targets and other key forestry issues such as forest law enforcement, governance and trade (FLEGT). All the countries are lacking and lagging behind full implementation of forest related climate change work, and in MRV of REDD+ programme activities (Kakuru 2013).

While in the 1990s, the Governments of Italy, Germany, Norway, Finland and Canada supported national forestry programmes including technical forestry and capacity building through the entire SADC region, southern Africa currently

lacks the human resource capacity for forest management and related activities, as there are few trained staff with high attrition rates in government in favour of alternative employment in the NGO and/or private sectors. It has been estimated that on average one professional forester is responsible for 10,000 ha of forests, depending on the country (Makano 2012). In addition, like in other Africa regions, there is lack of budgetary allocation to PFAs for forest management activities. For example, in Botswana, Malawi, South Africa and Zambia the budget allocation was US\$392 156 for the management of approximately 68,600,171 ha of forest area, which translates to US\$5.72 per ha per year (Makano 2012).

In the Sahel region, Burkina Faso's forest policy was guided by its long standing ecological problems. Clearly small-scale forest enterprise and non-timber forest products (NTFPs) are not prioritized. In Gambia, forestry has undergone significant change and transformation with a new Forest Act and the Forest Policy (2010–2019), and success has been reported (Bihibindi 2013 and Popoola 2013a, 2013b).

From the previously centralized approach, there has been a shift towards community forestry and participatory forestry management (Kakuru 2013, Makano 2012; Dlamini 2012). However, political commitment is lacking in the public forestry sector, and very low budget allocations to PFAs limits their ability in responding to new and emerging challenges such as climate change and its impacts on development. International multi-lateral organizations such as FAO, UN, GEF, WWF, IUCN and others play a significant role in financing forestry development. The Centre for International Forestry Research (CIFOR) has greatly assisted forestry development in the region through strategic policy research. The Sahel region also has well established public forestry administrations and its uniqueness is the stringent laws on access to forest resources by local people (Popoola 2013a, 2013b and Bihibindi 2013).

### Measures and strategies towards improvement

#### *Human Capacities*

East Africa region has significant human resource capacity at different levels of training and expertise for the effective forest management and climate change work. The existing human resource capacity, reflected in Table 1, is capable of spearheading forest management in the context of on-going and preliminary climate change mitigation and adaptation initiatives (Kakuru 2013). Moreover seeing that climate change is a multi-sectoral, inter-sectoral and multi-disciplinary issue, the PFAs can borrow personnel from other sectors to engage in climate change work.

The most prominent challenges in Southern Africa is lack of properly trained and qualified staff to lead and manage the forestry programmes and projects, including forestry related climate change work. As a result almost all Forest services operate with staff far below the required levels to effectively carry out their mandate. For example in Botswana there are 45 professional forest staff compared to the required 450. Sadly in Zambia and Malawi the World Bank/IMF induced Structural Adjustment Programme (SAP) resulted in the

TABLE 1 *Human resources within public forest institutions in East Africa*

Countries	Graduates	Diploma holders	Certificate holders	Skilled workers	Total
Burundi	30	42	39	56	167
Ethiopia	683	3114	317	3803	7917
Kenya	264	510	1238	3064	5076
Rwanda	38	9	220	–	267
Sudan	285	538	–	2197	2482
Tanzania	178	440	714	–	1332
Uganda	330	290	100	100	820

Source: Chamshama (2011). NB. It is assumed that all forestry staff participate in forest-related climate change work as it is part of sustainable forest management.

unfortunate situation of the retrenchment of forestry professional staff, yet these are essential (Makano 2012). In terms of human resources development, the Southern Africa region has a reasonable number of training institutions for forestry and natural resources management. These include in Universities and Colleges in Mozambique, Tanzania, Zambia, Malawi, South Africa, and others. Table 2 presents data on human resources availability in Malawi and Zambia's Forestry Department as at 2012.

As it is the case with West Africa, it is difficult in the Sahel region to ascertain the exact status regarding human capacities in the region, but is clear that there are varied staffing levels and in general there is lack of human resources in PFAs. In Gambia for example the lack of trained professional staff has led to challenges in forest policy implementation with some sub-sectors within forestry (such as the commercial fuel-cutters and other licensed forest users) lacking supervision. In addition forestry related climate change work like REDD+ preparations are inadequately capacitated.

TABLE 2 *Human resources availability in Malawi and Zambia's Forestry Department as at 2012*

Staff Category	Current Strength	Optimum Staff Level <sup>1</sup>	Current Ha/Staff
<b>Malawi</b>			
Professional	97	169	11,340
Technical	110	223	10,000
Field Staff	178	444	6,180
<b>Sub-total</b>	<b>385</b>	<b>836</b>	
<b>Zambia</b>			
Professional	53	353	12,9307
Technical	130	817	52,718
Field Staff	385	950	17,800
<b>Sub-total</b>	<b>568</b>	<b>2,120</b>	
<b>Grand Totals</b>	<b>953</b>	<b>2,956</b>	

<sup>1</sup>Optimum staffing level is the most ideal for the department to manage the forest resource in each country

Source: Makano (2012)

But the REDD+ financing mechanisms have a capacity building component (Popoola 2013a, Bihibindi 2013).

### *Financial capacities*

Financing climate change investments in Africa is done through internationally established initiatives such as CDM, which is a Global Environmental Investment and Credit Scheme that allow compliance trading of certified credits (AMCEN 2011).

In East Africa, the majority of countries are characterized by low budget/funding for PFAs which directly or indirectly undermines the ability and institutional capacity to deliver on their mandate and national obligations, see Table 3 (Kakuru 2013). Most countries are deficient in economic and technical capacities in areas that are key in capturing market value, designing and formulation sustainable and innovating financing mechanisms for meeting new and emerging challenges (such as climate change work), ensuring equitable benefit sharing and fostering sustainable resource uses and management in the midst of international and other external market pressures over existing standing stock of natural resources, including forest resources. A dedicated funding mechanism has been established under the Forest Carbon Partnership Facility (FCPF) to provide incentives to member states/countries for sustainable forest management, forests stewardship, forest conservation and forest conservation efforts. From the same Fund most countries will receive seed or catalytic funding or grants to build their capacity for REDD+, including emissions reference levels, adaptation strategies to reduce deforestation and in help in designing monitoring and evaluation systems and frameworks (Kakuru 2013).

In Southern Africa, low budget allocations to PFAs result in negative effects on the management of the vast forest estates. Countries raised low budgetary allocations as their main concern and as the root cause of their failure to address deforestation and forest encroachment and forest extension (Makano 2012). In the 2008–2012 period the total budget allocation was US\$392, 496,156 (US\$5.72 per ha). The South Africa alone government allocated US\$304 228,000 while Botswana invested US\$55, 830,936 and Malawi's budget was US\$10, 775 137 (Refer to Table 4 for more details). An illustration a further skewed distribution of the already

TABLE 3 Forestry management budget in the Eastern Africa region (US\$ million)

Year	Burundi		Ethiopia		Kenya		Rwanda		Sudan	Tanzania		Uganda	
	Govt	DP	Govt	Govt	DP	Govt	DP	FNC	Govt	Govt	DP		
02/03	*	*	*	13.5	0.7			*	*	*	*		
03/04	*	*	*	16.5	3.4			*	*	*	*		
04/05	*	*	*	15.4	4.0			*	*	3.7	3.8		
05/06	*	*	*	19.2	2.4			8.81	*	3.8	4.2		
06/07	*	*	*	18.4	10.6			10.5	*	4.1	3.0		
07/08	*	*	*	21.2	12.0			11.8	*	5.7	1.4		
08/09	*	*	*	24.0	13.3			12.3		6.7	0.9		
09/10	0.553	17.44	8.52	24.0	14.0	2.75	36.26	12.6	9.92	5.3	1.0		

\*Data not available, DP=Development Partner, FNC=Forests National Corporation (Sudan)

Source: Kakuru (2013)

low national budget allocated to PFAs can be seen in Zambia, refer to Figure 1. Field operations are operating under extremely low budgets yet there are massive forestry and climate change activities (Makano 2012).

The Sahel region, like in the other regions, is faced with low budget allocations to PFAs, which have negative impacts on the implementation of national forest policy and associated national forestry programmes and forest plans (Bihibindi 2013).

#### Physical capacities

Most countries in the Sub-Saharan Africa region lack adequate physical capacities that would enhance forest management in the era of climate change mitigation and adaptation initiatives. Formation of a regional partnership and pooling these capacities together and strategizing jointly through regional integration would be the most ideal option in maximising the impact (Kakuru 2013). The poor state of infrastructure in most African countries is widely known as one of the major factors increasing the vulnerability of the continent. Poor infrastructure is negatively impacting basic needs for the African citizen including, clean water, energy, health, education, access to markets and investment. Projected increases in the magnitude and frequency of extreme events if coupled

with underlying infrastructure vulnerability in hazard prone zones, will lead to multiplication of human and infrastructure vulnerability to damages and losses in the future. Access to infrastructure services is crucial to facilitate economic growth and poverty alleviation particularly in poor low-income countries. Efficient infrastructure and services are therefore crucial to Africa's integration and development (AMCEN 2011).

Physical capacities are supported by International Development Agencies and International Research Organization, and these include: The Food and Agriculture Organization on the United Nations (FAO), the United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), the United Nations Forum on Forests (UNFF), the World Conservation Union (IUCN), the World Wildlife Fund (WWF), and recently the African Forest Forum (AFF) and others have over the years generated global databases on forest resources and help generate research and interventions in critical ecosystems and critical biodiversity areas. In addition, leading international research organizations such as the Centre for International Forestry Research (CIFOR), the International Union Forest Research Organizations (IUFRO), International Institute for Environment and Development (IIED), Centre International de Recherche Agricole pour le Development (CIRAD) and others are heavily

TABLE 4 Budgetary allocation in Southern Africa forest agencies 2008–2011

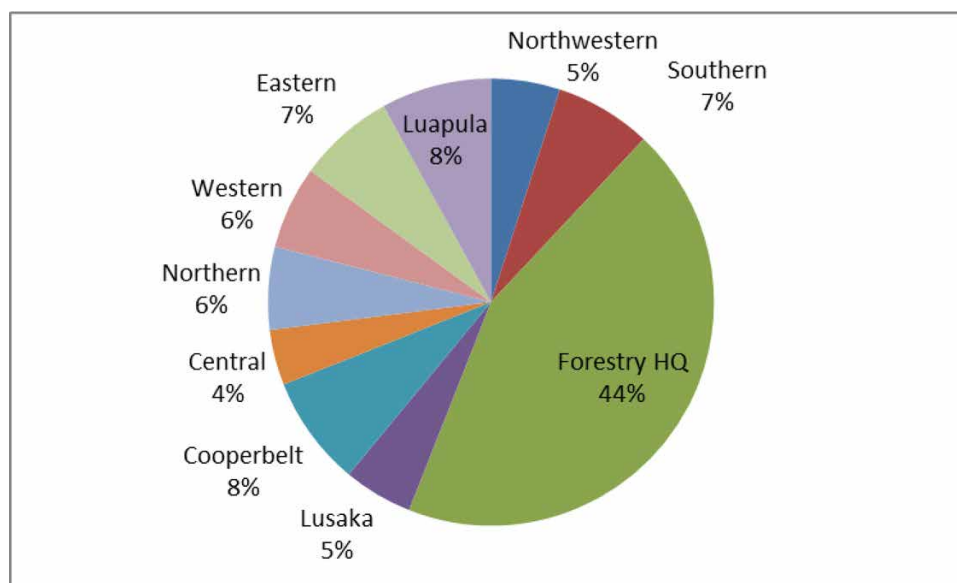
Country	Forest reserve (Ha)	Budgeted (US\$)	Revenue (US\$)	Cost/Ha	Revenue/Ha
Botswana	6,210,954	55,830,936	45,120	9.00	0.007
Malawi	1,100,000	10,775,137	ND <sup>1</sup>	9.80	ND
Mozambique	54,300,000	ND	28,480,866	ND	0.525 <sup>2</sup>
South Africa	215,928	304,228,000	12,885,954	1,409,00	59.68
Zambia	6,853,289	21,662,083	3,850,400	4.53	0.80
<b>Total</b>	<b>68,600,171</b>	<b>392,496,156</b>	<b>32,436,807</b>		
<b>Average</b>				<b>358.08</b>	<b>4.80</b>

<sup>1</sup>ND stands for No data available

<sup>2</sup>Total budget for woodlands and indigenous forests between 2008 and 2012 was US\$41,569,000, an average of US\$8,313,726 per year

Source: Makano (2012)

FIGURE 1 Percentage of budgetary allocation to Zambia's Forestry Department 2008–2012



(Source: Makamo 2012)

involved in global comparative research at the science/policy interface responding to policy and strategy questions. These organizations also give answers to complex challenges that practitioners face in the field (AMCEN 2011, Kakuru 2013).

#### Monitoring, reporting and verification (MRV) and biodiversity safeguards

Sound MRV processes are necessary to demonstrate and track implementation of mitigation efforts and also to ensure financial support is being delivered. It also provides an opportunity to showcase tangible mitigation efforts that have been implemented and estimate their contribution to national emissions reductions (AMCEN 2011).

Based on a Criteria used by Herold *et al.* cited in Mvondo (2013) for analysis of global distribution of capacity gaps in monitoring, reporting and verification (MRV) for different countries, the East Africa region faces serious capacity challenges in MRV. Table 5 presents the existing capacities for MRV in various countries. According to Kakuru (2013) the following challenges are common amongst dry forest and woodland countries regarding MRV:

- Most countries have limited experience in estimation and reporting on National GHG inventories, in application of the IPCC GPG and there is limited engagement in the UNFCCC REDD processes since their inception,
- There is low existing capacities to continuously or regularly assess and measure forest area changes and changes in forest carbon stocks as part of a national forest monitoring system (i.e. for reporting carbon stock changes on the IPCC Tier 2 level, which is regarded as the maximum requirement),
- There are peculiar challenges for REDD implementation procedures and complexities that may not be relevant for all countries and requires investment to observe

more IPCC key categories and move towards Tier 3 level measurements, and

- The availability of useful Data sources for REDD monitoring is hampered by availability of common satellite Data sources (e.g. Landsat, SPOT, CBERS, etc.) which may have limited use due to lack of receiving stations, persistent cloud cover, seasonality of issues, topography, inadequate data access infrastructure and other issues.

For mapping, all countries in the East Africa region are considered to be having large gaps for MRV (Mvondo 2012).

Generally, SADC countries have only limited technical, institutional and human resource capacities to collect measurable and reliable data on forest area and changes to it, to establish a reference level or to develop a monitoring system. In addition, the majority of SADC Member States do not have up to date inventory data on forest resources (SADC 2011, Makano 2012). The major MRV project in Southern Africa was the development of a regional approach to MRV which was seen to be cost efficient with the view to enable Member States to prepare for participation in a future REDD+ mechanism. This is particularly relevant for capacity building activities and the development of regional MRV standards. This was manifested in the Project “Development of Integrated Monitoring Systems for REDD+ in the SADC region. The project is being implemented jointly by the Food, Agriculture and Natural Resources Directorate (FANR) of the Southern African Development Community (SADC) and the German International Cooperation (GIZ) on behalf of the Federal Ministry of the Environment. The technical development of the MRV system, its implementation in the pilot countries, and several parts of the training measures is undertaken by a consortium of GAF AG, DFS German Forest Service and GeoTerra Image.

The Sahel region is at the preliminary stages of REDD and REDD+ programmes and as such the PFAs do not have



TABLE 5 Relative levels of existing capacities of MRV in the Eastern Africa region

Country	Engagement in UFCCC REDD process	Completeness of GHG inventory	Forest area change monitoring capacity	Forest inventory capacity	Remote sensing technical challenges	Proportion of tree canopy cover >40%	Amount of intact forest	Importance of fire/biomass burning	Carbon storage in forest soils
Burundi	High	Complete	Very low	Very low	Low	Low	None	Medium	Large
Eritrea	Medium	Advanced	Very low	Very low	Low	Low	None	Medium	Low
Ethiopia	Low	Low	Good	Very low	Medium	Low	None	Medium	Large
Kenya	Medium	Advanced	Very low	Limited	Medium	Low	None	Medium	Large
Rwanda	Medium	Advanced	Very low	Good low	Low	Low	None	Medium	Large
Somalia	Low	Low	Very low	Very low	Medium	Low	None	Medium	Low
Sudan	Low	Low	Some	Limited	Low	Low	None	Medium	Some
Uganda	Low	Low	Limited	Good	Medium	Low	Some	High	Some
Tanzania	Medium	Advanced	Some	Very low	Low	Low	Some	High	Some

Source: Kakuru (2013). This is the only available data at the moment. Actual MRV capacities are not yet available in literature.

adequate capacities for Monitoring, Verification and Reporting (Popoola 2013a 2013b, Bihibindi (2013). However, according to Traore (2013) the AGRHYMET Regional Center (information and training) was created in 1974 has a mandate to contribute to achieving sustainable food security and rational natural resource management in the Sahel region. AGRHYMET is responsible for:

1. Capacity building of member States Technical offices (training, equipment and financial support), and
2. Production and dissemination of information to various decision makers (national authorities, cooperation partners, NGOs and farmer associations).

At the regional level, the AGRHYMET Centre is backstopping the countries in monitoring capacities.

## CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that PFAs have been transformed from the ancient and old age 'policing' type of forest protection and conservation into a new regime which is people-centred that embraces participatory approaches to forest management. Thus, as opposed to the traditional forest management that was based on production and maximization of profits orientated objectives (with little or no regard for environmental, social and/or cultural objectives), now principles, criteria, indicators and standards for sustainable forest management, forest management have been introduced. These include productive and protective functions of forests, the promotion of climate change mitigation and adaptation and participatory forestry. With the exception of East Africa, most countries in Africa lack capacity to undertake the current magnitude of forest and climate change related activities.

It is recommended that countries need to elevate the national profiles of their PFAs commensurate with the crucial roles forests play in national development. This could be achieved through better national accounting for the

contributions of forest products and services to GDP and through high level policy advocacy. The trend of PFAs towards sustainable forest management, forest management for ecosystem goods and services, climate change mitigation and adaptation, sustainable development and the green economy should be clearly articulated and documented to reflect the critical role of the forestry sector in international development. There is urgent need for national and regional initiatives on capacity building for PFAs. In particular, there is need for such initiatives to help countries evaluate the appropriateness of the programmes and recommendations of UNCED, IPF, IFF, UNFF, AFF, AU-NEPAD, SADC, COMESA etc. Countries should stabilise and strengthen their PFAs through improved governance through their involvement in, for example, African Forest Law Enforcement and Governance Initiative (AFLEG).

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