



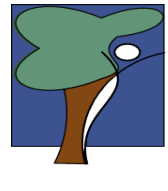
FAO



Republic of Zambia



Forest Department



NFP Facility

Forests and Climate Change

Integrating Climate Change Issues into National Forest Programmes and Policy Frameworks

Background Paper for the National Workshop, Zambia

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ACRONYMS

AER	Agro-Ecological Region
AFOLU	Agriculture, Forestry, and Other Land Use
CAADP	Comprehensive Africa Agriculture Development Programme
CBD	Convention on Biological Diversity
CBNRM	Community-Based Natural Resource Management
CBU	Copperbelt University
CC	Climate Change
CCD	Convention to Combat Desertification
CCIDU	Climate Change Information and Data Unit
CCFU	Climate Change Facilitation Unit
CFC	Copperbelt Forestry Company
CDM	Clean Development Mechanism
CEO	Chief Extension Officer
CEEEZ	Centre for Energy, Environment and Engineering Zambia
CEPRON	Community Enterprises Promotion Network
CIFOR	Center for International Forestry Research
COMESA	Common Market for East and Southern Africa
COP	Conference of Parties
ECZ	Environmental Council of Zambia
EMA	Environmental Management Agency
EPPCA	Environmental Protection and Pollution Control Act
ENRMMP	Environment and Natural Resources Management Mainstreaming Programme
EU	European Union
DMMU	Disaster Management and Mitigation Unit
FAO	Food and Agricultural Organization
FD	Forestry Department
FNDP	Fifth National Development Plan
GEF	Global Environment Facility
GHG	Greenhouse Gases
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
ILUA	Integrated Land Use Assessment
INC	Initial National Communication

IUCN	International Union for the Conservation of Nature (The World Conservation Union)
JFM	Joint Forest Management
KCM	Konkola Copper Mines
MACO	Ministry of Agriculture and Cooperatives
MEWD	Ministry of Energy and Water Development
MDGs	Millennium Development Goals
MLDF	Ministry of Livestock Development and Fisheries
MoFNP	Ministry of Finance and National Planning
MoU	Memorandum of Understanding
MRV	Monitoring, Reporting and Verification
MTENR	Ministry of Tourism, Environment and Natural Resources
NAPA	National Adaptation Programme of Action
NAPCD	National Action Plan to Combat Desertification
NCCRS	National Climate Change Response Strategy
NCS	National Conservation Strategy
NEAP	National Environmental Action Plan
NEPAD	New Partnership for Africa's Development
nfp	National Forest Programme in Zambia
NFPF	National Forest Programme Facility
NGO	Non Governmental Organization
NISIR	National Institute for Scientific and Industrial Research
NPE	National Policy on Environment
NSA	Non-State Actors
NTFPs	Non Timber Forest Products
NWP	Non Wood Products
PEO	Principal Extension Officer
PPCCR	Pilot Project for Climate Change Resilience
PFAP	Provincial Forestry Action Plans
PSRP	Public Service Reform Programme
REDD	Reducing Emissions from Deforestation and Degradation
RTSA	Road Traffic and Safety Agency
SADC	Southern African Development Community
SCCF	Special Climate Change Fund
SFM	Sustainable Forest Management

SLM	Sustainable Land Management
SNC	Second National Communication
SNDP	Sixth National Development Plan
TIZ	Transparency International Zambia
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNZA	University of Zambia
VAC	Vulnerability Assessment Committee
WWF	World Wildlife Fund for Nature
ZFC	Zambia Forestry College
ZCSCCN	Zambia Civil Society Climate Change Network
ZAFFICO	Zambia Forestry and Forest Industries Corporation
ZFAP	Zambia Forestry Action Plan
ZMD	Zambia Meteorological Department
ZVAC	Zambia Vulnerability Assessment Committee
ZAWA	Zambia Wildlife Authority
ZEMA	Zambia Environmental Management Agency

1.0 INTRODUCTION

Climate change has emerged as one of the world's greatest developmental challenges in the 21st century. Across the globe climate change has caused serious damage to the environment and to human life in general. According to expert assessments, global warming is expected to have worst impacts in Africa, South and West Asia; suggesting that developing countries are more vulnerable to climate change than developed countries.¹ Left unabated, climate change threatens to reverse hard-earned developmental gains made over the decades. But timely national responses to mitigate and adapt to climate change impacts can abate the situation.

The growing evidence of climate change has heightened the need to utilize forests as carbon sinks. However, the ability to utilize forests for carbon sequestration and carbon storage will not come easily; it will require coordinated efforts, starting with incorporating this new set of ideas into national forest programmes, forest policies and legal statutes. To this effect, the Forestry Department (FD) in Zambia, with financial support from the Food and Agriculture Organization (FAO), is organizing a consultative workshop with key stakeholders to chart the way forward.

Zambia is one of the nine (9) pilot countries for the UN-REDD Program. Under this program it is envisioned that the country will quickly develop a national REDD strategy to address climate change issues. With it also comes the possibility that Zambia could become part of the global REDD+ mechanism. Therefore, bringing key stakeholders together to help develop the guidelines for integrating climate change issues into national forest programmes is timely.

1.1 *Rationale and Scope of the Paper*

This paper reviews Zambia's efforts in addressing climate change challenges. It pulls together existing information (from documents and stakeholder interviews), describes the current evidence, and identifies issues and gaps pertaining to climate change. It gives an overview of national vulnerability to climate change, the policy and institutional framework to address climate change, and actions/strategies taken to mitigate and adapt to climate change in Zambia. The paper provides a basis for further discussion at the national workshop on integrating climate change issues into national forest programmes, policy and legal frameworks. The workshop will bring together key stakeholders from government agencies, academia, civil society organizations, natural resource conservation and research institutions, industry, and development partners.

The objectives of the national workshop are:

- ❖ To share global and national experiences on climate change and forest issues (including REDD);
- ❖ To identify key issues, gaps and possible collaboration areas pertaining to climate change mitigation and adaptation in Zambia;
- ❖ To propose appropriate responses / actions on the identified key issues and gaps in order to achieve the desired improvements; and
- ❖ To propose appropriate policy and institutional frameworks that will effectively address climate change challenges in Zambia.

¹ UNCTAD/TDR/2009

- ❖ To enhance the National Consultant's background paper on "Integrating Climate Change Issues into Forestry Programmes" and validate it;

2.0 BACKGROUND

Zambia's forests cover roughly 66% (49.9 million ha.) of the total landmass, of which 9.6% are protected forests where the FD has direct mandate. The ILUA study estimates total biomass to be 6.34 billion tonnes of which 5.6 billion tonnes is growing stock (above and below ground), while 434 million tonnes is dead wood biomass. Approximately 2.8 billion tonnes is stored in this biomass. Out of the total forest area, 63% (about 31 million ha) are in customary land and only 24% (12 million ha) are on state land. Private accounts for 5 million ha. Over 65% of these forests are secondary regeneration, making them candidates for carbon sequestration due to their active growth status.² However, forests are currently under threat from deforestation, a drawback to climate change mitigation. Between 1990 and 2000, Zambia had the highest rate of deforestation (851, 000 ha) in Southern Africa, which alone accounted for almost half the deforestation in the SADC region.³ The Integrated Land Use Assessment (ILUA) study estimated annual deforestation rate in Zambia to be around 300,000 ha. Given the role deforestation plays in raising greenhouse gas emissions (GHG), this is clearly an area of great concern.

2.1 Demographic Trends

Zambia's population has steadily increased from 3.5 million at independence (1964) to 13 million people today (2010 census estimate). Currently, population growth is estimated at 2.9% per annum. An increase in population usually translates into demand for more land for human settlement, farmland, industrial expansion, etc. and also increases consumption levels for forest resources. Changes in land use for creation of new cities or expansion of existing ones is an area of concern because land used for cities usually becomes a permanent feature, never to revert to the original [environmentally friendly] land use. Though cities occupy a small area globally (roughly 1%), cities alone account for 97% of carbon dioxide emissions globally suggesting that GHG emissions are basically an urban problem. Cities generate and consume huge amounts of waste and water, respectively. As at December 2006, annual waste generation in Zambia was estimated to be 2 million tonnes;⁴ Lusaka alone (the biggest city in Zambia)⁵ accounting for 79, 313 tonnes of partial waste collected in 2005.⁶ No statistics available for associated emissions from landfills.

2.2 Forest Resource Situation

According to Forestry Department (2007), Zambia's total forest reserves, legally defined as National and Local Protected Forests stands at 9.6% of total national landmass. These comprises of 180 National Forests and 307 Local Forests covering 5,145,162 hectares (6.8%) and 2,076,062 hectares (2.8%) of the total land area of the country, respectively. However, between 31 December 2004 and 31 December 2007, de-gazettions reduced the protected forest estates by 126,912 ha; from 7,344,692ha (9.76%) to 7,217,780ha (9.59%).

² FD/FAO, *ILUA 2008*:xiv

³ FAO, *Forest Outlook Study For Africa - Sub-regional Report, Southern Africa* (2003)

⁴ ECZ, *Zambia Environment Outlook Report 3*, 2008:p119

⁵ This figure is way below the total waste generated in Lusaka; most areas in Lusaka do not receive waste collection services.

⁶ ECZ, *Zambia Environment Outlook Report 3*, 2008:p124

These 126,912 ha were given out for settlement and agriculture expansion between 2004 and 2007.

In terms of management, the 2007 statistics showed 221 forest reserves (45.4%) classified as being intact, while 266 (54.6%) were encroached or depleted. This scenario is a source of concern because forest loss depletes the carbon sink and affects the REDD objective. Table 1 shows the distribution of forests by management plan.

Table 1: Percentage of Area and Type of Management in each Province.

Province	Type of Management and Area (%)		
	Formal	Traditional	Not Known
Central	30	45	25
Copperbelt	22	29	50
Eastern	33	24	42
Luapula	2	46	51
Lusaka	42	37	21
Northern	18	60	22
North Western	29	46	24
Southern	35	49	16
Western	6%	21	73
Total %	23%	41%	36%

Source: ILUA, December 2008:45

Localized population pressure has led to loss of protected forests (PFs) in some areas. For instance, Lusaka city alone consumes 250,000 tonnes of charcoal (equivalent to 1.4 million tonnes of wood) annually. If widely accepted, the Lusaka CDM Project (which uses twigs in energy saving stainless stoves) could reduce forest loss from 1.3 tonnes of charcoal (equiv. to 7 tons of wood) to nearly 0.5 tonnes of twigs per year.⁷

Currently, 65% of Zambia's population is in rural areas, their livelihoods essentially tied to the land and forests. Increased demand for food, wood energy, and other environmental services (to cater for the growing population) has contributed to decrease in forest areas. Between 1990 and 2010, FD lost 126,912 ha. through degazettions, but not a single hectare was added to the protected forests as new reservations over the same period.

In 1996, total wood volume (from the nation's 59.5 million ha. of forests) was estimated to be 47.33 m³, out of which 850,000 m³ was harvested as commercial timber; 5 million and 8 million cubic meters harvested for fuel wood and charcoal, respectively. Wood for non-fuel local community needs is estimated to be slightly above 1 million cubic meters a year. Total wood consumption was roughly 15 million cubic meters per year (about one third growth of all forests in Zambia).

2.3 Land Tenure and Forest Ownership

There are two (2) types of land tenure systems in Zambia (with one subdivision): Trust land also referred to as the "native land" (*customary land*, 55%), with its subdivision called reserve land (*non-tribal land*, 35%); and State land (*land in and around townships*, 10%).

⁷ FD, *Completion Report: The National Forest Programme Facility*, 2008:8

Both the Reserve and Trust land are administered on behalf of the local people by the traditional rulers under a customary law, while state land is administered by central Government through the Commissioner of lands in the Ministry of Lands, where title deeds may be offered to individuals, institutions and companies.

The Forests Act of 1973 describes the establishment, control and management of protected forests. It also provides for the ownership, tenure and access rights in open forests. There is free access to forest resources for domestic use but require a license for commercial use. Following the inaction to activate Forest Act No. 7 of 1999, an amendment was made to the Forests Act No. 39 of 1973 to incorporate the joint forest management (JFM) concept. This amendment, *Statutory Instrument No. 47 of 2006*, gave legal mandate to collaborative initiatives that enables individuals, groups or corporate entities to get involved in forest management.⁸ Since the introduction of JFM, numerous community-based natural resource projects have been implemented under the MTENR. For instance, seven (7) areas were established as JFM projects in Southern and Copperbelt Provinces.

All land in Zambia is vested in the Republican President on behalf of the Zambian people (Land Act). The ILUA study found that 61% of the land is under traditional rulers' (Chiefs) jurisdiction,⁹ quite a huge shift from the 1960s when central and local government together owned only 6% of the land (at independence) while the remaining 94% was Chief's land.¹⁰ Naturally, central government relies heavily on Chiefs' goodwill for any activities requiring expansion of forest estates. This "ownership" arrangement has great implications for forestry programmes (e.g. the UN-REDD). How easy will it be to bring more forests under such programmes? Will the Traditional leaders (who have more land) be willing or encourage their people and local investors in their areas to commit land for the carbon trading investments?

Another important consideration on forest management in Zambia, particularly for the expansion of carbon markets, relates to the prevailing "dual state" system: the classic (traditional) chiefdoms *versus* the contemporary (modern) state called Zambia. As noted above, Chiefs have rights on more land than the modern State, which means the state (central government) has no absolute control over land. And because it owns so little, central government will continue to depend on Chiefs' goodwill to manage the forests sustainably. Mobilizing local community participation is a must. Does the Forestry Department have the institutional capacity for this undertaking? Is the current organizational structure conducive for this task? What functional and operational changes, if any, will be necessary to prepare the Forestry Department for this task?

2.4 Social and Economic Values and Utilization of Forests

The economic importance of forests in Zambia is well documented.¹¹ Not only do forests provide a variety of wood and non wood products (NWPs) and services, forests also support numerous industries such as copper mining, manufacturing, construction, transport (railways), energy, agriculture, tourism, wood processing and allied companies. In other

⁸ Refer to *Statutory Instrument No. 47 of 2006*,

⁹ FAO/ FD, *ILUA*. 2008:1

¹⁰ Makano, *Does Institutional Capacity Matter?* 2008:256

¹¹ Forest Department, *National Forestry Policy of 1965; National Forestry Policy of 2000*; FD, Annual Reports, from 1965 to 2005; Oscar S. Kalumiana, *Study of the Demand and Supply of Firewood and Charcoal in Central Province*. 1996; GRZ, *Zambia Forest Action Plan (PFAP)*, 1998; Esa Puustjarvi; Guni Mickels-Kokwe and Moses Chakanga, *The Contribution of the Forest Sector to the National Economy and Poverty Reduction in Zambia*, September 2005; MENR, *Zambia Forest Action Plan*, 1996, Volumes I, II and III.

words, forests create employment way beyond their boundaries, and employ more than what national statistics portray. Therefore, when forests are decimated or their productivity declines, as climate change is likely to do, such impacts go way beyond the forest boundaries; the whole economy gets affected. Forest loss translates into loss of livelihoods. Currently, there are no statistics to illustrate these positive impacts from forests.

According to the Department of Energy, about 79% of Zambia's population¹² (90% in rural areas) depends on wood-based energy.¹³ In terms of income, forests in Zambia contribute about US\$197 million annually to rural household incomes. But this figure drops to around US\$175 million (roughly 11% reduction) when forest degradation sets in,¹⁴ which means that when forest productivity declines this has grave consequences on the rural and even unemployed urban population.

Forestry sector contribution to gross domestic product (GDP) has been problematic to account for separately mainly because forestry was classified under agriculture. Second, some forest products are reflected under manufacturing or industry. For instance, in 2006, the agri-forestry group accounted for 13.8% share of national GDP, at constant 1994 prices, beating the mining sector which brought in 9.1% in the same year. But to date, mining continues to be portrayed as the back bone of Zambia's economy.

For a long time, forestry contribution to GDP was reported to be below 1%. Between 1989 and 1993 forestry GDP contribution was the lowest among all sectors: a marginal 0.9% (an annual average of US\$26.2 million).¹⁵ In 2003 (Table 2) and 2005 forestry accounted for 5.4% of GDP. The largest portion of the 2005 figure came from forest based industries which contributed 3.7%, of which 2.2% was from charcoal production, 0.8% from fuel wood collection. Commercial logging and non-timber forest products accounted for 0.3% and 0.1% of GDP, respectively.¹⁶ In 2008, the Forestry Environment Vision Consulting Company (FEVCO) found that forestry contributes 5.6% to GDP instead of 1% previously reported between 1989 and 1993.¹⁷ Furthermore, FEVCO noted that forests also contribute to poverty reduction, particularly for forest dependent rural poor communities. If forestry resources and services were properly accounted for, the GDP share from forestry would most likely be higher.

2.5 World Bank Governance Indicators

Good governance refers to the ability of any governing authority to be accountable, transparent, efficient, effective, and responsive to the will of the governed. It should be an equitable system that also upholds the rule of law. Good forest governance would entail management practices that embrace these core principles, which would lead to collaborative and sustainable forest management.

While good governance (GG) is relatively a young field, and its conceptual framework still being refined, there is however some consensus on the key elements that constitutes GG. To measure governance effectiveness, the World Bank analyzes it under six dimensions, namely:

¹² Department of Energy, Energy Bulletin, 2000

¹³ MENR, *Zambia Forest Action Plan*, Vol. II, 1998:16-17

¹⁴ Puustjarvi, Mickels-Kokwe and Chakanga, *The Contribution of the Forest Sector to the National Economy*, September 2005

¹⁵ MENR, *ZFAP Vol. II*, 2006:15

¹⁶ ILUA, 2008:13-14

¹⁷ Forestry Department, *Completion Report: The National Forest Programme Facility*, 2008:5

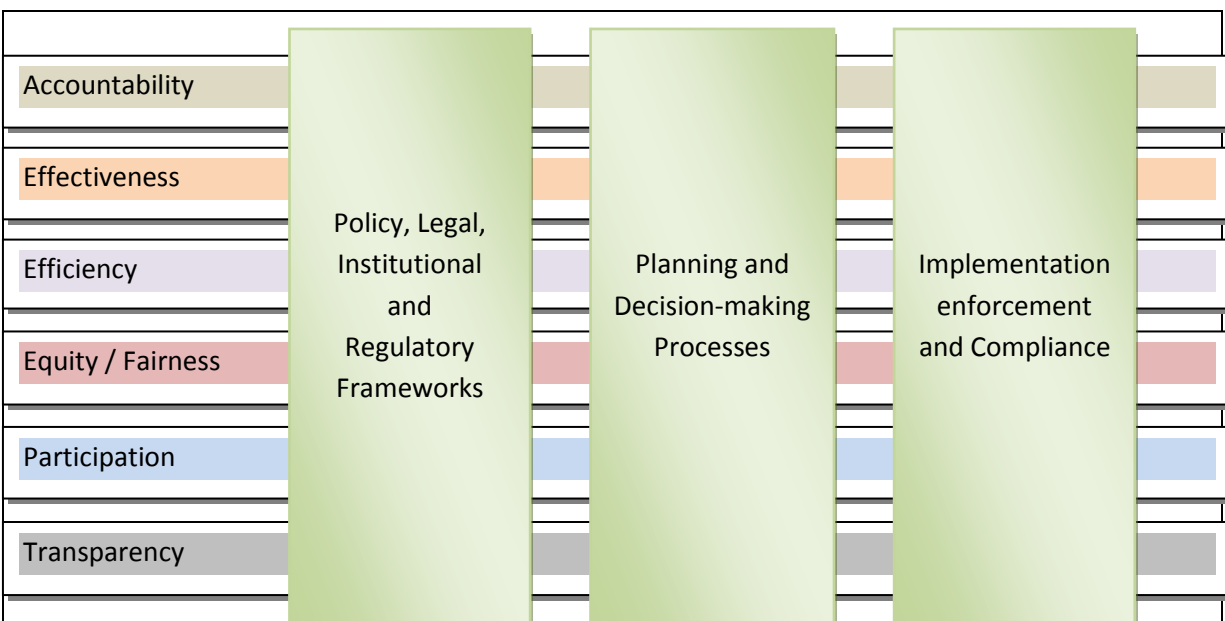
Voice and Accountability, Political Stability and Absence of Violence, Effective Government, Quality of Regulatory framework, the Rule of law, and Control of Corruption. In this respect, and specific to forestry, governance should be seen as the “context and product of the interaction” from among different “actors and stakeholders with diverse interests,”¹⁸ who are guided by some generally accepted pillars and principles of “good” forest governance as Figure 1 illustrates.

Table 2: GDP Contribution from Natural Resources, 2003.

Category	Sector	GDP Contribution (%)
Natural Resource Base (excluding Tourism)	Agriculture	15.3
	Fishing	2.7
	Forestry	5.4
	Mining & Quarrying	7.8
	Electricity, Gas & Water	2.8
	Manufacturing	10.9
	Subtotal	44.9
Other		51.1
	Total	100.0

Source: ILUA, 2008:14

Figure 1: Good Forest Governance Framework.



Source: PROFOR/FAO, *Framework for Assessing and Monitoring Forest Governance*, (2011:p10)

¹⁸ PROFOR/FAO, *Framework for Assessing and Monitoring Forest Governance* 2011:10.

Generally, governance is considered to be good if the system permits transparency and stakeholder participation in decision-making, upholds the rule of law, demands equity for and accountability from all actors. Ultimately, adherence to these principles would lead to efficient and effective management and utilization of resources, including equitable sharing of benefits.¹⁹

Table 3 summarizes how the World Bank ranks Zambia on good governance, on a scale of zero (0) to one (1). Although there has been some slight improvement in all but one indicator, Zambia's governance is generally poor; all the indicators are below 1. For instance, Voice and Accountability improved from -0.49 to -0.09; Political stability from -0.59 to 0.29; Government effectiveness (-0.77 to -0.66); Rule of Law (-0.60 to -0.50), and Control of Corruption (-1.09 to -0.48). The nation has slid backwards in the Quality of Regulatory Framework (from 0.34 to -0.33).

Zambia's poor governance status may have implications in the forestry sector too. Suffice to say, since the FAO has commissioned a consultant to look at "Integrating Forest Governance Monitoring into National Forest-related Monitoring Systems," it is anticipated that governance issues will be adequately articulated under that study.

Table 3: Zambia Governance Indicators, 1996-2008

NO.	ITEM	2008	2007	2006	2005	2004	2003	2002	2000	1998	1996
1	Voice and Accountability	-0.09	-0.23	-0.31	-0.48	-0.38	-0.35	-0.36	-0.41	-0.49	-0.49
2	Political Stability & Absence of Violence/Terrorism	0.29	0.14	0.13	-0.11	-0.10	-0.23	-0.45	-0.50	-0.22	-0.59
3	Effective Government	-0.66	-0.62	-0.73	-0.92	-0.82	-0.85	-0.81	-0.96	-1.06	-0.70
4	Quality of Regulatory framework	-0.33	-0.52	-0.59	-0.63	-0.56	-0.58	-0.62	-0.16	-0.01	0.34
5	Rule of law	-0.50	-0.59	-0.63	-0.57	-0.58	-0.63	-0.49	-0.55	-0.58	-0.60
6	Control of Corruption	-0.48	-0.59	-0.74	-0.77	-0.86	-0.88	-0.98	-0.94	-0.92	-1.09

Source: Kaufmann, Daniel; Aart Kraay & Massimo Mastruzzi (2009), *Governance Matters VIII: Aggregate and Individual Governance Indicators 1996–2008*. World Bank, June 2009. Pp-

Challenges and Opportunities

- Laxity in afforestation/reforestation efforts, e.g. plantation establishment and expansion likely to lead to timber deficits. The ZFAP (1996) projected this problem to set in by 2006.²⁰
- Official statistics on forest sector contribution to national economy greatly undervalues its true value. Forestry sector not yet fully developed hence marginal GDP contributions.
- Lack of research to update forestry data. Forestry Research Division and other research entities need strengthening to generate data to support informed decisions.
- Larger population dependent on land & forest resources.

¹⁹ PROFOR/FAO, *Framework for Assessing and Monitoring Forest Governance* 2011:10

²⁰ MENR, *ZFAP Vol. II*, 2006:14

- Forest resources undervalued, but are critical to poverty reduction and food security improvement.
- Climate change offers an opportunity to embrace rational forest resource utilization.
- Limited data & knowledge about carbon markets stocks and markets. Clarity needed on the cost-benefits of the carbon trade / carbon markets.
- Lack of incentives for forest conservation reduces participation in forest management.
- Common pool resources *versus* private ownership. What avenue and model would be suitable to increase forest areas in Zambia?
- Modern state versus traditional state, implications for forest management.
- Limited capacity to adapt to climate change.
- No provisions for transboundary conservation efforts such as trans-frontier conservation areas (TFCAs).
- Women's participation in forest resource management limited by land tenure arrangements, cultural norms / stereotypes, information, training and education.

3.0 IMPACTS OF CLIMATE CHANGE AND ADAPTATION OPTIONS

Many studies on the effects of climate change on forests have focused on the ability of species to withstand variations in temperature and moisture. But, depending on the geographical location, climate change also has the potential to affect forest ecosystems by altering the frequency, intensity, duration, and timing of fire, drought, introduced species, insect and pathogen outbreaks, hurricanes, windstorms, ice storms, or landslides. All these dimensions (besides moisture and temperature) have huge implications on forest ecosystems and subsequently on humans too, and therefore require research attention. Both natural and human-induced disturbances change forest ecosystems by influencing their composition, structure, and functional processes. In Zambia, natural disturbances with the greatest effects on forests include wildfires, drought, suppression by invasive species (*introduced plant species*), excessive rainfall, and attacks by insects and pathogens. Each forest is affected differently; some disturbance may cause serious and large-scale tree mortality, whereas others may only affect a small community without causing massive damage. All these natural disturbances interact with human-induced effects on the environment, such as air pollution and land-use changes arising from resource extraction, agriculture, urban and peri-urban expansion, and recreation. Lasting solutions are possible through policy interventions that promote adaptation-mitigation approaches.

In Zambia, climate change impacts, particularly from floods and droughts have caused serious damage to crops and infrastructure. Assessment of climate change evidence in Zambia is shown in Table 4 below.

Generally, annual rainfall has declined across the country since 1940 to 2005. On average the country received 58 mm (6%) less annual rainfall between 1971 and 2005.²¹ In particular, agro-ecological region I (southern parts of Southern & Western Provinces) was drier and more prone to climate change/variability.

²¹ CCFU, *Information Needs Assessment and Identification of Gaps in Climate Change*, pp1-2 & 9-11, September 2010.

Table 4: Climate Change and Adaptation Assessments.

INSTITUTION		STUDY / ACTIVITY	COMMENTS
	Forestry Department /FAO	Integrated Land Use Assessment (ILUA)	<p>The ILUA study highlights the strategic position of forests in carbon sequestration and storage. It established that forests in Zambia store as much as 2.63 billion metric tonnes of carbon.</p> <p>The study also generated useful data on the economic importance of forests to the national economy and poverty reduction, all of which are useful inputs for climate change interventions.</p>
	CCFU (under the MTENR)	<p>National Adaptation Programme of Action (NAPA)</p> <p>National Climate Change Response Strategy (NCCRS)</p> <p>Climate Change Finance: The Case of Zambia, 2010</p> <p>The Economics of Climate Change in Zambia, 2011.</p>	<p>NAPA provides a roadmap for adaptation activities, and identified vulnerable sectors and recommends actions to be undertaken.</p> <p>The NCCRS provides a multi-sector investment framework to guide climate change interventions. See Annex 3. Vision: “ A Prosperous Climate Change Resilient Economy” Mission: “To ensure that the most vulnerable sectors of the economy are climate proofed, and sustainable development achieved through the promotion of low carbon development pathways.”</p> <p>Provides an overview on funding sources for climate change & financing options.</p> <p>Analyses the economic impact of climate change in Zambia for six (6) sectors: Agriculture, Natural Resources, Energy, Water, Health and, Infrastructure.</p>
	IUCN-The World Conservation Union	Climate Change and Development Programme	Assessment of site specific evidence of climate change; identification of climate change hazards & impacts on livelihoods. Selected Sesheke (AER I), Kapiri Mposhi (AER II), and Mwansabombwe/Mansa (AER III).
	Meteorological Department	Weather monitoring & forecasting.	Weather monitoring activities – includes climate change data collection and dissemination. ZMD manages 38 stations and 8 agro-meteorological stations.
	Environmental Council of Zambia	<p>Zambia Environment Outlook Report 3 (2008)</p> <p>The National Communication Project</p> <p>a) Initial National Communication (INC)</p> <p>b) Second National Communication (SNC)</p>	<p>Recognizes climate change as a challenge requiring government’s immediate attention.</p> <p>The INC undertook initial national vulnerability & adaptation assessments. Identified vulnerable areas / sectors.</p> <p>The SNC in Draft, not yet in the public domain.</p> <p>SNC is a GEF/UNDP funded project, launched 2008. One SNC objective: To plan & integrate climate change concerns into national development frameworks & strategies.</p> <p>The SNC builds on the INC and lessons learned from the NAPA. Covers all sectors and evaluates sensitivities, thresholds and vulnerability of natural systems. Undertakes national GHG inventory. The SNC will provide an in-depth analysis of the impacts of climate change on the most vulnerable sectors in Zambia.</p>
	University of Zambia (UNZA), under the School of Agriculture, and SADC studies.	Climate change impact on Agriculture	The study established a general rainfall decline across the country, 1940 to 2005. Specifically, seasonal rainfall declined by 58 mm (6%) for the period 1971-2005.

	INSTITUTION	STUDY / ACTIVITY	COMMENTS
	Zambia Civil Society Climate Change Network (ZCSCCN)	Budget Tracking Study (2010) Climate Justice Statement in Zambia. (A Statement submitted to 16 th COP of the UNFCCC at Cancun, Mexico. 2010).	To understand and ascertain government's commitment to address climate change challenges. Raises concerns regarding the funding mechanism for carbon trading; benefits from carbon trading to resource poor local communities; the financial burden placed on developing nations to produce National Communications Reports on emissions and mitigation actions; and the shift of emphasis from a legally binding Kyoto Protocol on emission reductions by developed nations to a voluntary regime on the same. Advocates for strategic partnerships to engage members in Annex 1 prior to COP 17, to take place in South Africa this year (2011).
	Department of Water Affairs	Integrated Water Resources Management & Water Efficiency Implementation Plan	A long term strategic plan that anticipates assessing climate impacts on water resources.
	Department of Energy	Climate Resilience and Mitigation	The program, articulated in the SNDP, aims to develop two strategic plans: The Vulnerability Assessments and Risk Management Plan for the energy sector; and a Mitigation Action Plan.
	Disaster Management & Mitigation Unit (DMMU)	Vulnerability and Assessment Reports, since 2003 to date	The assessments identify vulnerable areas prone to floods & droughts and highlight needs arising due to climate induced disasters.
	Centre for Energy, Environment and Engineering Zambia (CEEEZ)	Climate Change Information and Data Unit (CCIDU)	Has set up a data a baseline climate change/variability (1970-2000) for temperature, runoff and water abstractions from the Zambezi basin. CEEEZ will use this data to project rainfall and temperature for 2010 to 2070. CCFU used the info from CCDICU for the NAPA.

Between 1970 and 2000 a slight increase in temperature was also observed across the country, showing warm rates per decade of 0.48° C, 0.34° C and 0.26° C for agro-ecological region I, II, and III, respectively (**Figure 2**).²² Furthermore, regional temperatures between 1961 and 2000 showed a decrease in extreme cold days and nights (5th percentile) by -3.7 and -6.0 days per decade, respectively. Over the same period, heat occurrence (95th percentile) during the day and night increased by 8.2 and 8.6 days per decade, respectively. The Department of Water Affairs is undertaking a long term climate impact assessment on the water resources to ascertain the links between water availability and quality and, climate change. This project started in 2002 and is ongoing.

3.1 Evidence of Climate Change Impacts

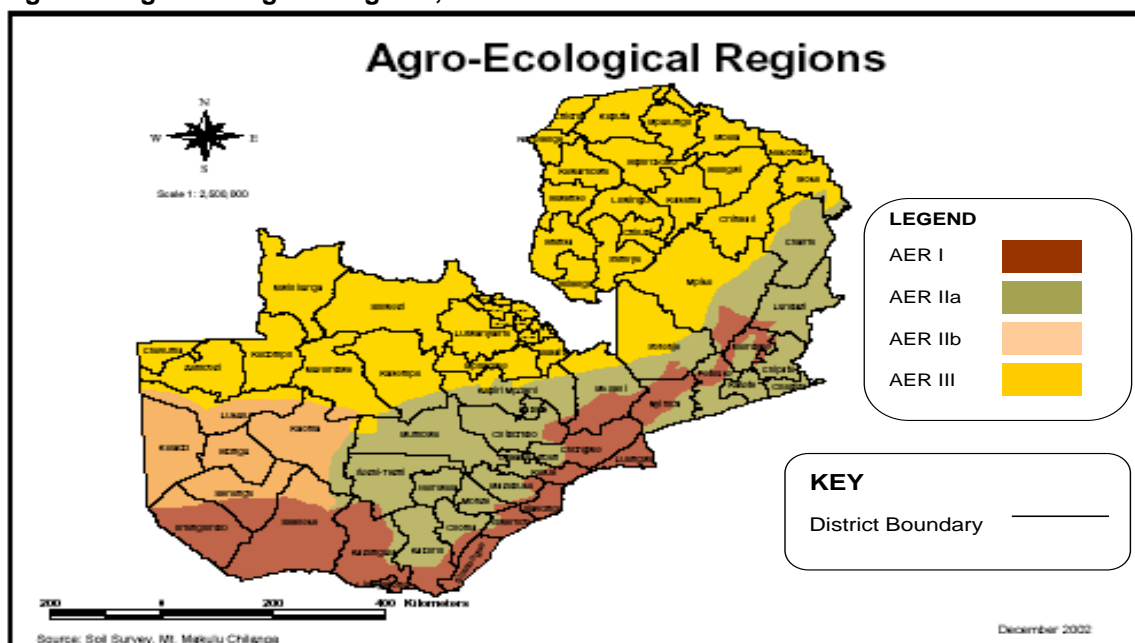
Evidence of climate change impacts in Zambia have been noted particularly in land-based activities. Droughts, seasonal/flush floods, and extreme temperatures have affected both humans and the ecosystems: caused damage to crops (deepening food insecurity and poverty), as well as energy infrastructure, and affected water and its quality.²³ The most serious of these have been the 1991-92 droughts, and 2006-07 floods; the latter affected over

²² CCFU, *Information Needs Assessment*, p9-10.

²³ MTENR, 2007 - NAPA

1 million (1,443,583) people in 41 Districts across the country.²⁴ Though not as severe as the 1991-92 drought, the 2004-05 drought also caused irreversible damage to crops in two thirds of the country, which forced Zambia to import food. On the other hand, the 2009-10 floods affected 238,254 people (39,709 households). Over the last two decades, droughts and floods have increased both in frequency and intensity.

Figure 2: Agro-ecological Regions, Zambia.



3.2 Vulnerability of the Country to Climate Change

Land-based activities have been identified as the most vulnerable sectors to climate change. These include agriculture, forestry, water, and anything in between (i.e. natural resources associated with these sectors).

As noted earlier, climate change is exacerbating food insecurity by causing extensive damage to crops, livestock populations, and affecting water availability. Climate change has reduced areas suitable for staple food by 80%. Studies show that food insecurity will deepen in Agro-ecological regions I and II because since late 1980s there has been a tendency for late onset and early withdrawal of rains, as well as more frequent droughts. Floods are now prevalent, becoming a danger to infrastructure too.

²⁴ DMMU, 2009 -CVAA

Figure 3: Maize Crop Damage due to Drought & Floods, and Infrastructure damage by floods.



Crop damage due to Drought.



Crop damage due to Floods.



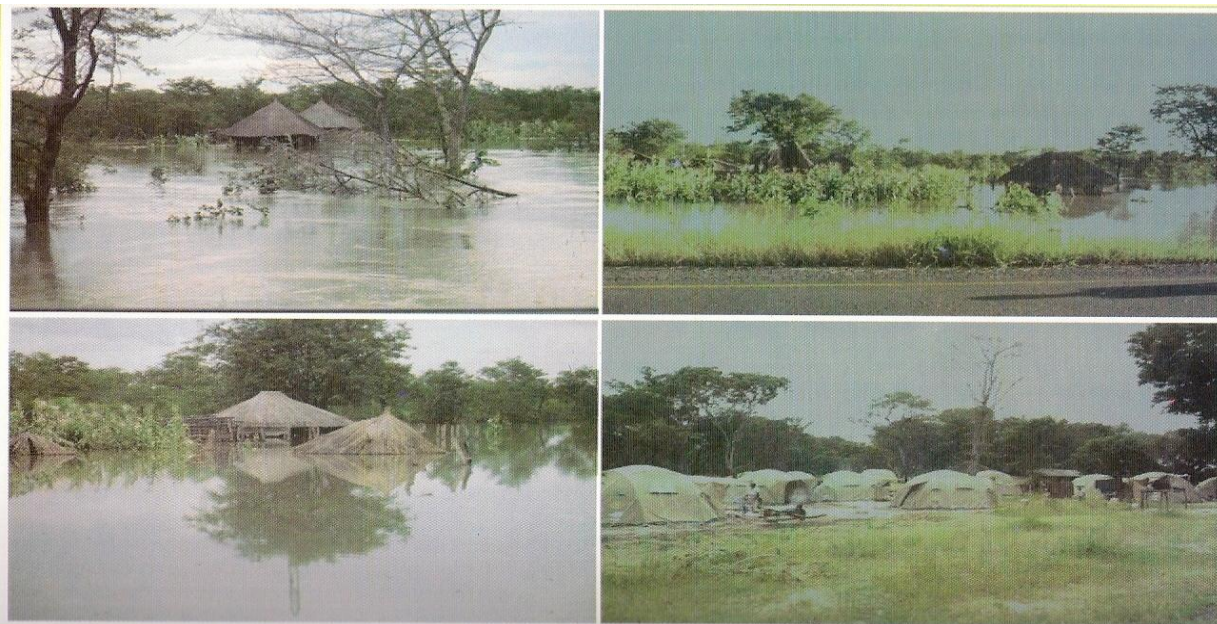
Road under stress from Floods.



Bridge reconstruction after Flood damage.

Source: DMMU/VAC, *In-depth Vulnerability & Needs Assessment Report*, (July 2010); ECZ, *Environment Outlook Report 3*, (2008).

Figure 4: Flooded Village and Campsite in Kazungula, Southern Province



Source: ECZ, *Zambia Environment Outlook Report 3*, (2008:171)

3.3 Adaptation Needs in Zambia

Climate change assessments, identification of vulnerability, and risk management are the first line of defense towards developing adaptation measures. Adaptation would not be possible in the absence of reliable and timely data. The FD, in collaboration with MACO, continues to promote sustainable agriculture through interventions such as agroforestry practices. MACO promotes sustainable land use practices and adoption of resilient crops. Table 5 highlights some of the projects promoting adaptation strategies. One project, *Adaptation to the effects of Climate Variability and Change in Agro-ecological Regions I and II in Zambia*, aims, among other things, to integrate climate change into national policies. This is a collaborative effort involving MACO, MTENR and ZMD. On the agricultural side, which also has mitigation effects on forests, the project focuses on two areas: i) mainstreaming adaptation into agricultural planning at national, district and community levels, and ii) test and evaluate adaptation value interventions that will protect and improve agricultural incomes against climate change.

Table 5: Projects Responding to Climate Change Resilience.

INSTITUTION	PROGRAMME / PROJECT	COMMENTS
MTENR	Environment and Natural Resources Management and Mainstreaming Program (ENRMMP), under PID.	ENRMMP seeks to improve coordination and implementation capacity in the environment and natural resource management sector. The programme is based on the principles, priorities and objectives of Zambia's Fifth National Development Plan (FNDP), forward looking to Vision 2030.
	Climate Change Facilitation Unit (CCFU), under ENR Dept.	The project aims at integrating environmental issues (including cc) into national programmes. One area of focus is environmental communication. The programme has an Environmental Fund to support implementation of practical initiatives.
	Okavango Inter-frontier Conservation Project	The Unit was set up to undertake studies on climate change issues in Zambia to provide data for informed policy decisions. CCFU has produced various insightful reports including the NAPA, and the National Climate Change Response Strategy (NCCRS), which have provided a policy framework on how to deal with climate change challenges.
	Luangwa Valley Ecosystems Partnership Management	A transboundary project in Western Province for integrated management of forest resources. The project involves five countries: Angola, Botswana, Namibia, Zambia and Zimbabwe.
	UN Reduced Emissions from Deforestation and Forest Degradation (UN-REDD) Project, just starting.	UN-REDD is a global initiative aimed at building capacity for multiple actors to address drivers of forest loss in order to reduce emissions from deforestation and forest degradation. Zambia is one of the 9 pilot countries in the world. The project is just starting.
MACO	Sustainable Land Management Programme; National Irrigation Development Programme	Promotes sustainable agricultural practices and climate change adaptation strategies.

INSTITUTION	PROGRAMME / PROJECT	COMMENTS
FAO/MACO	Conservation Agriculture Scaling-Up for Increased Production and Productivity	Improved agricultural practices in response to changes in climate.
MTENR/MACO UNDP/FAO	Adaptation to the effects of drought and climate change in Agro-ecological Regions I and II in Zambia.	The Project responds to the NAPA to build resilience capacity to communities in AER I and II. Major Outcomes: Integrate cc risks into policy; Make agric productivity resilient to cc impacts; Revise national fiscal, regulatory & developmental policy to promote adaptation; Adaptation strategies based on knowledge & lessons learned.
ZMD	Capacity development for effective Early Warning services to support climate change adaptation in Zambia	Promote national preparedness through real time weather forecasting.
ZARI	Building adaptive capacity to cope with increasing vulnerability due to climate change in Zambia	Develop seed varieties and agricultural practices suitable in different agro-ecological regions in response to climate change challenges.
IUCN	Climate change and Development Project	
MoFND	Pilot Project for Climate Change Resilient (PPCCR), just starting	Promote climate change resilience in all sectors.
Water Affairs Dept, MEWD	Water Resources Action Programme (EU/GTZ). Adaptation to Climate Change in Water Resources Management and Development	Formulated 1997, actual work started 2002. The program aims at management of water resources for adaptation to climate change; Conducting climate risk assessment for water resources infrastructure, including flood mapping in pilot areas; Constructing climate change proof water infrastructure to increase resilience; and Eradicating climate-sensitive vector-borne diseases in dams
Energy Dept, MEWD	Rural Electrification Programme Development of Renewable Energy Sources Various studies on production of bio-fuels Development of a Renewable Energy Strategy (2010).	Seeks to provide electricity supply to rural to enable more people access it. Anticipated to reduce demand for wood energy. Advocates for building more hydro-power stations in response to increasing electricity demand. Promotes the development and access to alternative energy sources such as solar, wind, and geothermal (e.g. Kapisha Plant in Northern Province & Chinyunyu in Chongwe, Lusaka Province). For example, Jatropha (for biodiesel); sugarcane, cassava, maize (for ethanol), agric waste, etc. Situation analysis for biomass, solar and geothermal undertaken. Project funded by UNDP.
MoFNP (RTSA/ECZ)	Introduction of Carbon Tax on Motor Vehicles	Aimed at reducing GHG emissions from vehicles and increasing government revenues.
OXFAM	Community Led Disaster Risk Reduction Project (Kazungula)	Promote community involvement in developing climate change adaptation strategies.
CFAARM	Consortium for Food security, Agriculture and nutrition, AIDS, Resiliency and Markets (Kazungula & Shangombo)	Encourages community involvement to develop coping strategies against climate change, food insecurity, HIV/AIDS, and market hazards.

Challenges and Opportunities

- Limited capacity to adapt to climate change.
- Climate change assessments available.
- Climate change data held by respective institutions, no central coordinator. Consider an online depository.
- A coordinating institution & central depository for climate change related data required.

4.0 MITIGATION ISSUES AND OPTIONS

The primary climate change mitigation intervention in Zambia lies in the 60% forest cover. This is an extensive carbon sink with great potential for future carbon sequestration. Efforts on sustainable forest management are well articulated in all policy frameworks (National Conservation Strategy, National Environmental Action Plan, Forestry Policy, National Policy on Environment, etc), strategic plans (ZFAP, PFAP), and the legal statutes (Forest Act 1973, Forest Bill of 1999,²⁵ Environmental Protection and Pollution Control Act of 1990, Land Act of 1996, Agricultural Lands Act of 1960, etc.). The NEAP (1994) provides a general policy framework upon which the ZFAP, a long term forestry strategic plan (1998-2018) builds. The ZFAP is also considered as a holistic national forest programme (nfp) in Zambia. In addition, international conventions such as the UNFCCC, CBD, CCD provide guidance on what is supposed to be done in relation to forests.

In addition, other mitigation options for climate change are also employed such as sustainable agriculture, the use of bio-energy from waste, energy efficiency and alternative sources of supply. And government has responded to climate change challenges through budgetary allocations specific to climate change related interventions (Tables 6).

Clearly, emphasis is placed on the role of trees as carbon sequesters and sinks and, it is not uncommon to hear people associating climate change to deforestation. These sentiments are particularly common in Southern Province where large tracks of land have been cleared for maize production and the region receives erratic rainfall. As the industrial plantations steadily disappear in the Copperbelt Province (a high rainfall area up north), followed by a change in rainfall pattern across the country, Copperbelt residents now share these frustrations about climate change and its impact on the rainfall pattern.

Despite the general consensus on the important role forests play in climate change mitigation, forestry programmes related to climate change received the lowest allocation compared to other departments. Between 2007 and 2009 Water Affairs Department received the largest budget share (ZMK 38.57 billion) followed by MACO (ZMK 13.194 billion). The forestry department was the least funded at (ZMK2.56 billion), with its sister department the Environment and Natural Resources receiving (ZMK2.949 billion) during the same period (Table 6).

There is need for Forestry Department to engage in further negotiations with the Ministry of Finance to increase its allocations for climate change mitigation activities. Currently, this can

²⁵ Not activated, but mentioned here to acknowledge the provisions it contains which are important for sustainable forest management.

be done under the Pilot Project on Climate Change Resilience (PPCCR), administered by the MoFNP. Other activities being undertaken include:

Table 6: Budgetary Allocation for Climate Change Activities for 2007-2009 (ZMK billion).

Sector/Institution	Budget Allocations to the key sector programmes			% Allocation in relation to Overall Sector Budget	Three-Year Total Budget to the Sector Programmes 2007-2009
	2007	2008	2009		
Agriculture	2.254	4.375	6.564	23.4%	13.194
Fisheries	0.868	0.420	0	4.0%	0.910
Environment & Natural Res.	0.850	0.899	1.226	3.5%	2.976
Forestry	0	1.178	0.074	4.8%	1.252
Energy	2.595	2.362	1.888	42.5%	6.856
Water	11.974	14.793	11.812	66.3%	38.579
DMMU	0.242	1.176	1.055	25.8%	2.474

Source: Abraham Makano, *National Budgeting Tracking in Relation to Climate Change*, (2011:5).

4.1 Afforestation & Reclamation of degraded lands

The FD is promoting rehabilitation of degraded lands through private-public partnerships. One such program encourages the mines to reclaim degraded lands by planting trees. Mopani and Konkola Copper Mines both indicated having a programme for rehabilitation of damp sites. However, due to limited time allocated to the field visit (outside Lusaka), it was not possible to verify how many hectares of degraded land has been replanted.

Last year (2010) the FD also reintroduced a programme of giving free seedlings during the tree planting month (December 15 – January 15) to encourage tree planting. This programme is open to all members of the public, but initially the FD's target is to give 500 seedlings to each of the 150 Members of Parliament to plant in their constituents. District Forest Officers will assist the MPs to identify degraded areas that need rehabilitation, and also provide technical support to do the actual planting. Assuming 1,000 seedlings are planted per ha, this programme would translate in planting 75 ha per year through this initiative.

4.2 Replanting of local supply plantations in all the nine (9) provinces

For the past 5 years, government has been financing establishment and replanting of local supply plantations in the provinces. In 2010, K2 billion was allocated for this, and K2.5 billion this year (2011).

4.3 Agroforestry practices

Agroforestry have been promoted for the past 10 years, as a potential tool for sustainable agriculture. Eastern Province (ICRAF being the major player), Southern and Central Provinces adopted the practice on a larger scale. But the agriculture support programme where government disburses "free" fertilizer to subsistence farmers to improve crops yields is steadily eroding the gains made over the years from agroforestry interventions. Farmers are

choosing short term convenience of using fertilizer against long term benefits from agroforestry practices.

4.4 Forest Plantations

The area *supposed to be*²⁶ under plantations is about 70,000 ha of which 60,000 ha belongs to the Zambia Forestry and Forest Industries Corporation (ZAFFICO); 7,000 ha are local supply plantations under FD, located in the Provinces; 1,000 ha belong to the for research plots; and the remaining 2,000 ha are privately owned. These figures may be lower or perhaps higher for two reasons. Since ZAFFICO, the largest plantation owner, and FD have not done extensive replanting over the years, plantation hecterage could be lower. It may be higher if private entrepreneurs have taken up tree growing, in which case privately owned plantations would compensate for the shortfall. It was not possible to get updated statistics on replanting.

4.5 Bio-energy from Waste

The Environmental Protection and Pollution Control Act (EPPCA) no. 12 of 1990, defines waste as garbage, refuse, sludge, and other substances discarded from domestic, community, commercial, and industrial activities.²⁷ ECZ classifies waste into three (3) categories: Municipal waste (comprising of domestic and commercial waste); industrial waste, and Hazardous waste.²⁸

In 2006, about 2 million tonnes of waste was generated, of which roughly 20% was disposed off at designated landfills. Out of the 72 districts only 16 had licensed municipal waste disposal sites, suggesting that waste management in Zambia is still a problem. Yet this same waste which can easily be found at homes, markets and, shopping malls can be turned into energy (e.g. methane from agro waste). The National Institute for Scientific and Industrial Research (NISIR) has the technology for methane production, it awaits commercial adoption. The following are some of the efforts regarding bio-energy from waste (Table 7).

Innovative ideas such as waste recycling should be encouraged as this is likely to create jobs and incomes, which would enable people to afford cleaner sources of energy. According to ECZ, some paper and plastic is being recycled (Table 8). What is not clear is if the recycled paper and plastic is the total waste generated in these categories or just a fraction of it.

4.6 Improvement of Fuel Wood Efficiency and Supply

Wood energy consumption has been rising with population growth and the expansion of industrial activities. Wood fuel consumption is clearly a major contributor to deforestation. Zambia consumes 8.8 million cubic meters of wood per year.²⁹

²⁶ This is qualified to indicate that since most of the clear felled plantations have not been replanted it is unlikely that the actual plantation stock corresponds to the hecterage.

²⁷ ECZ, Environment Outlook Report 3, 2008:118

²⁸ ECZ, 2008:118

²⁹ FAO, Forestry Outlook Study for Africa: Sub-regional Regional Report, Southern Africa, 2003.

Table 7: Bio-energy Initiatives

INSTITUTION	PROJECT/TECHNOLOGY	COMMENTS
National Institute for Scientific and Industrial Research (NISIR)	Coal & saw dust briquettes	Technology already developed, awaits commercial adoption.
	Methane production	As above
CDM Lusaka Sustainable Energy Project	SAVE 80 Stove & “Wonder Cooker”, a Lusaka-based CDM Project	The stainless steel stove, with 80% improvement in energy efficiency, is designed to use twigs (2cm diameter, 30 cm long). The “wonder cooker” stores warm foods and cook without fire. About 180,000 people expected to have SAVE 80 stoves by this year (2011). Need to establish plantations around Lusaka to provide feedstock.
Forestry Department	Kaputa Bio-gasifier Project	A private-public and local community partnership project meant to generate electricity through Biogasifier technology.

Source: Interviews (*personal communication*); FD, *Completion Report: NFP Facility (2008)*

Table 8: Waste Recycling, 2005-2006.

Type of Material	Amount Recycled (tonnes)		Destination (Market)
	2005	2006	
Paper	2,400	4,800	75% exported to Zimbabwe & South Africa for recycling (2005); 90% exported (ZIM & RSA) for recycling (2006).
Plastic	-	72 tonnes	All consumed locally

Source: ECZ, *Environmental Outlook Report 3, 2008:122*

The development of alternative, environmentally-friendly energy sources, discussed earlier, could ease dependence on wood fuel and therefore release the pressure on forests. For instance, the energy efficient SAVE 80 Stove (being produced under the Lusaka CDM Project) is anticipated to reduce wood consumption from 1.3 tonnes of charcoal (equiv. to 7 tons of wood) million to nearly 0.5 tonnes of twigs per year,³⁰ a 61.5% reduction. This saving will retain carbon stock needed for climate change mitigation. Therefore, the investment into and development of alternative energy sources must be taken as an urgent intervention towards climate change mitigation. These matters fall squarely under the Energy Policy domain and, to some extent the Science and Technology Policy. It will not be easy to tackle this problem through the Forest Policy alone. This is precisely why climate change interventions require multi-sectoral approaches. In this case, what is required is policy synergy among the different sectors so they can work collaboratively to achieve a common goal.

4.7 Reducing Emissions from Deforestation and Degradation (REDD)

Deforestation and forest degradation contribute significantly to climate change. Globally, tropical deforestation accounts for 3.8 billion tonnes of carbon release; that is roughly 20% of all carbon released by humans.³¹ The ILUA study estimated that forests in Zambia (excluding

³⁰ FD, *Completion Report: The National Forest Programme Facility (nfpf)*, 2008:8

³¹ FAO/FD, *ILUA*, 2008:67

plantations) store as much as 2.63 billion metric tonnes of carbon. The study further notes that this is not a total figure as it does not include carbon sequestered and stored in plantation stock, herbaceous plants, and underground plant biomass.³² It is clear that managed properly, forests will play an important role in reducing and mitigating climate change effects.

The UN-REDD Program in Zambia is still in its infancy, not much work has been done yet. However, with the Work Plan and Budget for 2011 in place, it is anticipated that the program will soon embark on executing the activities scheduled.

Challenges and Opportunities

- Zambia generates 2 million tonnes of waste per year, none of this is being utilized for energy generation e.g. methane.
- Existing bio-energy technologies developed by NISIR still await commercial adoption.
- Waste recycling could generate jobs and income that would in turn enable people to afford other cleaner energy sources such as solar.
- Solar and wind energy not yet widely adopted.

5.0 ADAPTATION-MITIGATION SYNERGIES AND TRADE-OFFS

Various organizations (Table 5 above) have either completed or have ongoing programmes / studies addressing climate change challenges. The CCFU's publications which include the NAPA (2007), NCCRS (2010), Information Needs Assessment and Identification of Gaps in Climate Change (2010) and, Economics of Climate Change in Zambia (2011) have become important reference points on climate change.

The ECZ will soon be releasing a Second National Communication (SNC) report soon. The SNC builds on what was achieved under the Initial National Communication (INC) and lessons learned from the NAPA.

The SNC covers all sectors, and assesses their vulnerability and adaptation to climate change. The SNC specifically looks at vulnerability and adaptation assessments in areas identified under the INC and those not adequately addressed under the NAPA and other related studies. With respect to forestry the SNC covers: i) Impacts/effects from and magnitude of wild fires on the forest resource; ii) Impacts of and magnitude of slash and burn agriculture; iii) GHG emissions from wildfires for 1994 and 2000-2007; and iv) GHG emissions from slash and burn agriculture.

The SNC is anticipated to provide a clear picture of the impacts of climate change on the most vulnerable sectors in Zambia. The main focus of the study was to:

- Evaluate how climate change affects anthropogenic activities and natural systems;
- Evaluate sensitivities, thresholds and vulnerability of natural systems;
- Identify possible technological improvements and practical adaptation measures designed to minimize climate change effects on the most vulnerable sectors that include forestry, agriculture (crops and livestock), fisheries, wildlife, water and health sectors.

³² FAO/FD, *ILUA*, 2008:67

5.1 Synergy

The past decades witnessed a strong advocacy for policy harmonization among all sectors and institutions that deal with the environment. How far this has been done can only be confirmed after the field interviews. However, progress has been made towards enhancing institutional collaboration among government, quasi-government institutions, and non-governmental organizations; including development partners. It is now an accepted standard to have multi-sectoral management committees to help in information processing and management of departmental programmes.

To this effect, there is some level of synergy being achieved through the multi-sectoral management committees; line agencies are knowledgeable about what is happening elsewhere and are able to express their concerns where programmes may be contradictory to or a duplication of what another agency might be doing. Secondly, there is synergy too in how various institutions are approaching climate change issues at policy level. The NAPA and the NCCRS are providing guidance on climate change impact response strategies. In this respect, the creation of a Climate Change Facilitation Unit (CCFU) under MTENR has been a timely development. Now the CCFU's efforts are complementing initiatives in other institutions too.

5.2 Trade-offs

Though not explicitly specified in the literature reviewed, the major concern on trade-offs relate to land development: between industrial development, agricultural production and human settlements on one hand, *versus* ecosystem conservation (be it for forestry, biodiversity conservation, aesthetic value or eco-tourism). Much [political] debate revolves around people's livelihoods. For instance, which areas should be opened for mining, and not for agriculture or human settlement? What is the potential for job creation from the activity? How much will government gain in terms of revenue? Environmental and natural resource activists are usually interested in knowing how much land will be lost or gained (in exchange). What will be the damage to the environment? The Republican President's recent "invasion" of Lusaka East Protected Forest, to pave way for a housing project, provides a good example of how this is playing out right now. Environmental activists against the idea have taken this issue to the "court of public opinion" to solicit support.

Recently, questions about equity on natural resources (who is being favored between foreign investors and local entrepreneurs) have also entered the debate. These and similar moral, access rights and, cost-benefit questions are likely to dominate the national debate. Further research is required because analysts or environmental impact assessors might go for short term benefits and over look the long term implications.

The introduction of a carbon tax in 2010 for motor vehicles was received with mixed feelings. Some people did not like the idea claiming that Zambia's GHG emissions were so low they did not warrant that "punitive" intervention on poor Zambians.

Challenges and Opportunities

- Various institutions engaged in climate change assessments.
- Strong local and international goodwill towards climate change interventions.
- Enhanced collaboration among government agencies, NGOs and development partners.

- Cost-benefit and opportunity cost analyses for forest conservation not available.
- Carbon tax in Zambia not fully understood. What contribution is it making to mitigate climate change?

6.0 INTEGRATING CLIMATE CHANGE ISSUES INTO FOREST POLICY, LEGAL AND INSTITUTIONAL FRAMEWORKS: NEEDS, ISSUES AND OPTIONS

This section briefly discusses national efforts on integrating climate change issues into forestry programmes and policy frameworks under seven sub-sections covering: Policy, Legislation, Organizational Framework, Governance Mechanisms, Information & Communication, Capacity, and Financial Arrangements. Some of the important documents to provide guidance in these thematic areas are: National Policies (NEAP, NPE, SNDP, Vision 2030, etc); National Forest Policies, Strategies, Programs & Plans (Forestry Policy, NCS, ZFAP, UN-REDD, ILUA, etc.); National CC Programs & Strategies (NAPA, NAMA, NCCRS, Needs Assessment, etc.); Legal Instruments (Forests Act 1973; EPPCA 1990; Lands Act 1996, Agricultural Lands Act 1960, etc.); and the International Conventions (UNFCCC, CBD, CCD, NLBI, etc.).

Zambia has a long history of promoting sustainable forestry management, and there is a long list of policies and legal statutes³³ that are relevant to address climate change challenges, which include, but are not limited to the statutes shown below (Table 9).

Table 9: Sectoral Policies

Within MTENR	Other Sectors ³⁴
<ul style="list-style-type: none"> • National Forestry Policy, 1998 • Forests Act no. 39 of 1973 • Forests Act no. 7 of 1999 (not activated, and currently under review) • National Policy on Environment, 2007 • National Environmental Action Plan (NEAP), 1994 • National Action Plans on Forestry, ZFAP and PFAP • National Action Plan to Combat Desertification • Environmental Protection and Pollution Control Act (EPPCA) of 1990 	<ul style="list-style-type: none"> • National Lands Policy, 2006 • Lands Act no. 29 of 1996 • National Agricultural Policy • Agricultural Lands Act, Cap 292 of 1960 • National Energy Policy, 2008 • National Water Policy, 2010 • Water Resources Management Bill (2010) (replacing Water Act, Cap 312 of 1949) • National Wildlife Policy of 1998 • Zambia Wildlife Act no. 12 of 1998 • Fisheries Policy (Draft) • Fisheries Act, Cap 314 of 2011 • Mining Sector Policy • Mines and Minerals Act no. 31 of 1995 • Decentralization Policy of 2002

³³ The list provided is not exhaustive, but indicates land based sectors with close connections to forestry. Given that forestry cuts across other sectors, almost all sectors influence what happens in forestry.

³⁴ Covers mainly land-based sectors, except the Decentralization Policy which deals with institutional devolution of power across sectors, from central government to the grassroots level.

6.1 The Policy Framework

The availability of policy is not a guarantee for programme success, implementers do. Programme failures arise as a consequence of failure to implement policy. For this reason, clarity in policy is important to remove vagueness. Climate change has been recognized in the Sixth National Development Plan (SNDP, 2011-2015), building on the Fifth (FNDP, 2006-2010).

The National Forestry Policy of 1998, currently under review, was promulgated through a consultative process involving key stakeholders from government Ministries, academia, industry, NGOs, traditional leaders (Chiefs) and, civil society organizations. Building on the Forest Policy of 1965, the 1998 Forestry Policy espouses sustainable forest management. It aims at facilitating a “sustainable flow of wood and non-wood products and services while at the same time ensuring protection and maintenance of biodiversity for the benefit of the present and future generations through the active participation of all stakeholders.”³⁵ Its overall objective is to enhance the forest sector’s contributions to national socio-economic development,³⁶ guided by the following set of principles:

- ❖ To ensure sustainable forest management;
- ❖ To build capacity for all stakeholders in sustainable forest management;
- ❖ To promote participatory forest management through strategic partnerships;
- ❖ To encourage private sector involvement in forestry development;
- ❖ To promote gender equity, particularly the involvement of women in forestry; and
- ❖ To embrace sectoral integration through inter and intra-sectoral collaboration.

While the 1998 Forestry Policy provides for the sustainable management of the forest resources, and the institutional and legal framework within which the policy will apply, the policy is silent on climate change issues. Probably this is because climate change effects had not becoming as devastating as they are today. The draft National Forestry Policy³⁷ takes climate change issues into consideration and stipulates measures to be undertaken. The draft National Forest Policy (2011) seeks to promote participatory forest management which will involve the active participation of local communities, traditional institutions, and other stakeholders in forest management. The draft Policy also covers issues relating to stakeholders’ roles, responsibilities, rights; resource ownership; and cost-benefit sharing mechanisms. In this respect, the policy is aligned with the Decentralization Policy (2002), Vision 2030, and the Sixth National Development Plan (2011-2015). Furthermore, the draft Forestry Policy recognizes opportunities and obligations under the regional and international agreements, such as the SADC Protocols on forestry and natural resources, MDGs, all forest related international conventions.

Considering that the current 1998 National Forestry Policy (which is under review) was based on the ZFAP framework (1998-2018), it has been noted that the ZFAP will also need updating to include climate change issues. Currently, this long term strategic plan on forestry in Zambia does not cater for climate change challenges.

³⁵ National Forestry Policy, 1998:3

³⁶ *Ibid.*, 1998:3

³⁷ The ongoing Forestry Policy review has reached an advanced stage, giving hope for a new policy soon.

Table 10 summarizes the policy provisions from the Forestry Policy and the National Policy on Environment, while Annex 1 gives similar information for other sectoral policies relevant to forest management.

Table 10: Forestry and Environmental Policies.

POLICY / PLANS	KEY PROVISIONS	CLIMATE CHANGE STATUS
National Forestry Policy, 1998	See the preceding discussion above.	Does not cover climate change. The current review process incorporates climate change into the Forestry Policy.
DRAFT National Forestry Policy, (2009/ 2011)	Reviews the 1998 National Forest Policy. The review process ongoing, started in 2009. Consideration being given to public-private partnerships, redefining gazetted forest areas (farm forests, community forests, botanical reserves, etc.).	Incorporates climate change issues.
Zambia Forestry Action Plan, 1996	A long term strategic plan on forestry that promotes sustainable forest management, and provides bankable projects in forestry.	Does not cover climate change.
National Environment Action Plan, 1994	The first policy framework on environment. Gives guidelines and strategies for environmental management.	Does not cover climate change.
National Policy on Environment, 2007	This first policy on environment sets the agenda for a harmonized approach to environmental management. Provides an umbrella strategy for a multi-sectoral approach to environmental and NR management problems. It captures nine (9) sectors and fourteen (14) cross-sectoral scenarios.	Covers climate change indirectly. It covers atmosphere and climate, placing emphasis on the need to “curb atmospheric pollution” as well as support ZMD to enhance its weather forecasting ability to buttress developmental and resource management activities.
DRAFT Tourism Policy (2011)		

Since national preparedness and responses to developmental challenges are more a matter of policy, the initiative to integrate climate change concerns into the Forestry Policy is timely. In fact, the Investment Framework in the NCCRS advocates for having a separate Climate Change Policy developed and Law enacted by 2016. This process is anticipated to review and harmonize existing policies and laws to make them climate change responsive. A total of US\$6.2 million will be required to undertake this activity, a figure reflected in the MTENR’s Strategic Planning-Action Plan Matrix for 2011-2015.³⁸

6.2 The Legal Framework

Generally all legal statutes and policies promulgated before 2010 do not cater for climate change issues. This includes the Forests Act of 1973. Table 11 summarizes key provisions the Forests Act and its status on climate change while Annex 2 covers the other key pieces of legislation relevant to forestry.

³⁸ CCFU, NCCRS Investment Framework , Annex 3.

Table 11: Legal Framework.

LEGISLATION	KEY PROVISIONS	CLIMATE CHANGE STATUS
Forests Act, No. 39 of 1973, CAP 199.	The Act provides for the establishment, control and management of protected forests. It also specifies ownership, tenure and access rights in open forests. It caters for joint forest management (JFM) approaches.	Not specified. Implied provisions for climate change interventions relate to sustainable forest management.
Forests Act, No. 7, 1999	Never activated, did not become law. Currently under review. The Forests Act of 1973 remains the active legal statute.	Forest Act 1999 had incorporated climate change issues; included objectives of UNFCCC; and management of forests for carbon trade. States the importance of community participation in cc mitigation and adaptation.
Environmental Management Act, No. 12 of 2011	Repeals the Environmental Protection and Pollution Control Act (EPPCA), No. 12 of 1990, CAP 204 which established the Environmental Council of Zambia (ECZ), a statutory regulatory body on environment and provided for the protection of the environment and control of pollution. The Environmental Management Act renames ECZ to Zambia Environmental Management Agency (ZEMA). The Act provides for integrated environmental management through the protection and conservation of the environment and sustainable management of natural resources, including all mandates relating to the prevention of and control of pollution, and environmental degradation. EMA establishes the Environmental Fund, and provides for environmental impact assessments on proposed policies, plans and programmes; audits, and monitoring; facilitating implementation of international agreements and conventions to which Zambia is a party. Essentially, the Act expands the ZEMA's mandate.	The Environmental Management Act (EMA) incorporates climate change issues.

The ongoing review of the Forests Act has taken into consideration climate change challenges. It is anticipated that the new law will also clarify issues related to benefits sharing for JFM and CBNRM approaches, provide guidelines and necessary protection for carbon trade, give incentives to attract more participation in forest conservation, including clarity on issues related to carbon tax.

6.3 Institutional Framework

Forest management institutional framework starts at central government where MTENR is connected. FD is mandated to manage the forestry resources in Zambia. As a forest manager, the Forestry Department provides the practical connection to central government.

Although Forestry Department is mandated to manage forest resources in Zambia, this responsibility is somehow shared with other stakeholders that either own the land or influence forestry management through their activities. And these include the Chiefs (who own 61% of the land) and private land owners,³⁹ line ministries and agencies⁴⁰ whose

³⁹ For details refer to the previous discussion under item 2.3 *Land Tenure and Forest Ownership* in this paper.

mandates touch on forest resource management, research institutions, academia, professional associations, NGOs and civil society organizations, cooperating partners who finance environmental and forestry related programmes, and environmental activists concerned over various issues relating to environmental and natural resource management. How FD manages its relations and collaboration with these entities has an important role not only on the outcomes of its programmes but more importantly on how positively involved these groups become in forest management, and subsequently in climate change issues.

Clarity on stakeholders' roles, responsibilities and rights – including cost-benefit sharing mechanisms – is an important consideration if sustainable forest management is to become a reality. Forest governance issues can no longer be left to FD alone; this requires the participation of other key stakeholders as well. For instance, enforcement agencies such as the Zambia Environmental Management Agency (ZEMA, formerly ECZ), and the Bureau of Standards have important roles to play to enhance forest governance. In this respect, FD's institutional capacity to deliver on its mandate should be assessed from its organizational structure. Can the current structure enable FD to competently handle additional emerging issues such as climate change?

6.3.1 Organizational Framework

FD's current organizational structure (Figure 6) has implications on its focus: forest extension seem to take priority over forest management. Prior to the 1997-2004 public service reform program (PSRP), FD had five Divisions: Forest Management; Forest Research; Forest Products Research; Extension; and Beekeeping (Figure 5). After the 1997-98 restructuring of the department, FD's structure was collapsed into two branches: Forest Extension (& Publicity), and Forest Research (Figure 6).⁴¹

Forest Extension Branch has wider coverage, with offices in all provinces (at provincial and district levels), while the Research Branch only has offices in Kitwe and Kalulushi, Copperbelt Province. The proposed structure (in-house discussions) envisions re-introducing Forest Management, Forest Products Research, and a new branch to cater for Forest Enterprise Development. Since FD has representation at provincial and district levels, is possible to easily disseminate climate change information and collect feedback from the grassroots level.

As noted earlier (e.g. Table 4 above), efforts to deal with climate change problems have been intensified beyond the MTENR. Line Ministries and other organizations are also undertaking various initiatives to tackle the problem. For instance, MACO has a program to identify sites for climate change resilience and how to enhance livelihoods in areas prone to droughts and floods. The ECZ has just completed a study that forms the basis for the Second National Communication (SNC) report. The Meteorological Department has now installed automated equipment that will transmit weather data in real time, without having a human interface to collect and report the information. The Ministry of Finance is managing a Pilot Project for Climate Change Resilient (PPCR). WWF, through the climate change network (ZCSCCN), has just completed a Budget Tracking study to assess how much the Zambian government allocates to climate change related issues. Assessment of areas for vulnerability and adaptation to climate change has now become DMMU's main area of focus.

⁴⁰ These include, but not limited to, Agriculture, Lands, National Environmental Agency (formerly ECZ), Tourism, Water and Energy, and ZAWA.

⁴¹ For a detailed account of the implications brought about by these institutional reforms, refer to Rosemary Makano (2008), *Does Institutional Capacity Matter?* Chapter 4:194-202.

All these developments should be applauded. However, much of this work is supported by external funding. Since the Forest Policy is silent on climate change, it will not be surprising if government does not finance climate change related programs in forestry. This is precisely one reason why climate change needs to be integrated into national policies and programs. It will provide a basis for government to finance such programs.

6.3.2 Governance Mechanisms

The Forests Act of 1973 is the principal legal document covering forest governance in Zambia administered through the organization structure presented in Figure 6 above. The Act is supported by other related legislation such as the Lands Act which provides for matter related to accessing land for forestry purposes. The channel of command starts from the Republican President to the Minister, through the Director of Forestry, to Provincial and finally to District level. Functionally, the Director Forestry reports to the Permanent Secretary not the Minister as the organizational chart seems to suggest. Officers at provincial and district level also report to their Provincial Ministers and Permanent Secretaries.

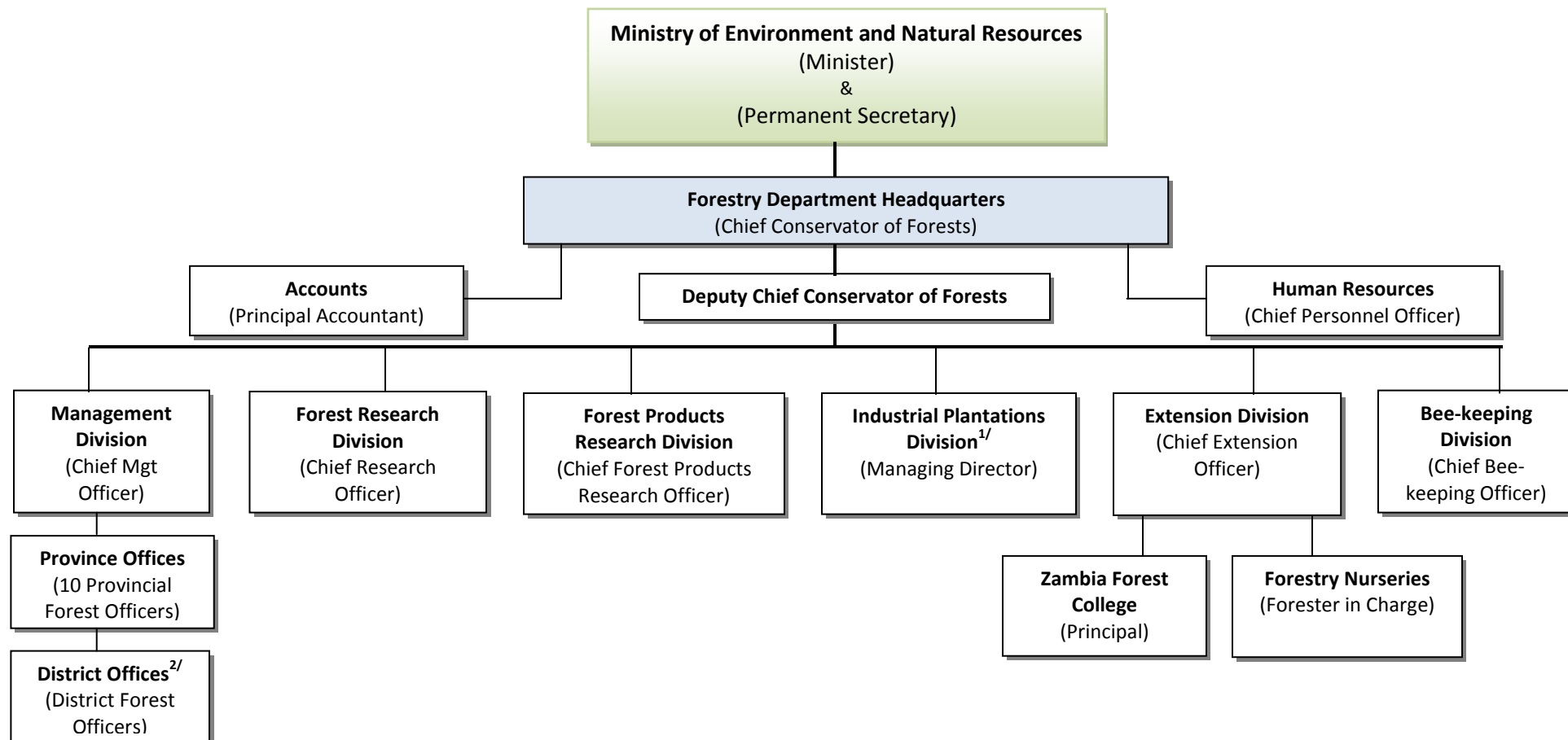
In the spirit of community participation, research institutions, academia, NGOs, professional associations, and community based organisations exert their influence on forestry in different ways – for instance, as conservationists, managers and resource users. In short, forest governance involves multiple players at different levels. Directly, forest-related bodies & governance mechanisms include FD/MTENR, Provincial and District Forest Offices, Research organizations, Forest related associations, NGOs, CSOs, etc. while climate-related bodies & governance mechanisms include CCFU, DMMU, and the Zambia Civil Society Climate Change Network (ZCSCCN).

In its current form (Figure 6), FD is too lean to competently handle the diverse actions required for climate change mitigation and adaptation. Furthermore, governance responsibilities between FD and other stakeholders are not very clear, despite the introduction of JFM and CBNRM approaches. Coordination with NGOs is generally problematic; the latter usually viewed with suspicion as a potential whistle blower. Lack of incentives for forest conservation was noted as a major obstacle to wider participation in forest management. One important consideration would be to analyze what responsibilities would be needed at national, provincial, and district levels to implement cc mitigation and adaptation strategies. Is it necessary to revisit FD's structure to improve forest governance?

6.4 Information, Communication and Research

Information and communication stands out as a problematic area. First the sector suffers from lack of and inconsistent research which results in having outdated data. For instance, there are no statistics on current forest stock, species composition, or effects of climate change on the forest ecosystem. The last national forest inventory was undertaken in 1986. That is 25 years ago! The ILUA study which attempted to update the forest data has also been received with skepticism. For instance, the ILUA gives the same old deforestation rates (250,000 to 300,000 ha per year) despite changes in demographics and other indices likely to affect forests. Cost-benefit analyses of the forest resources are yet to be undertaken.

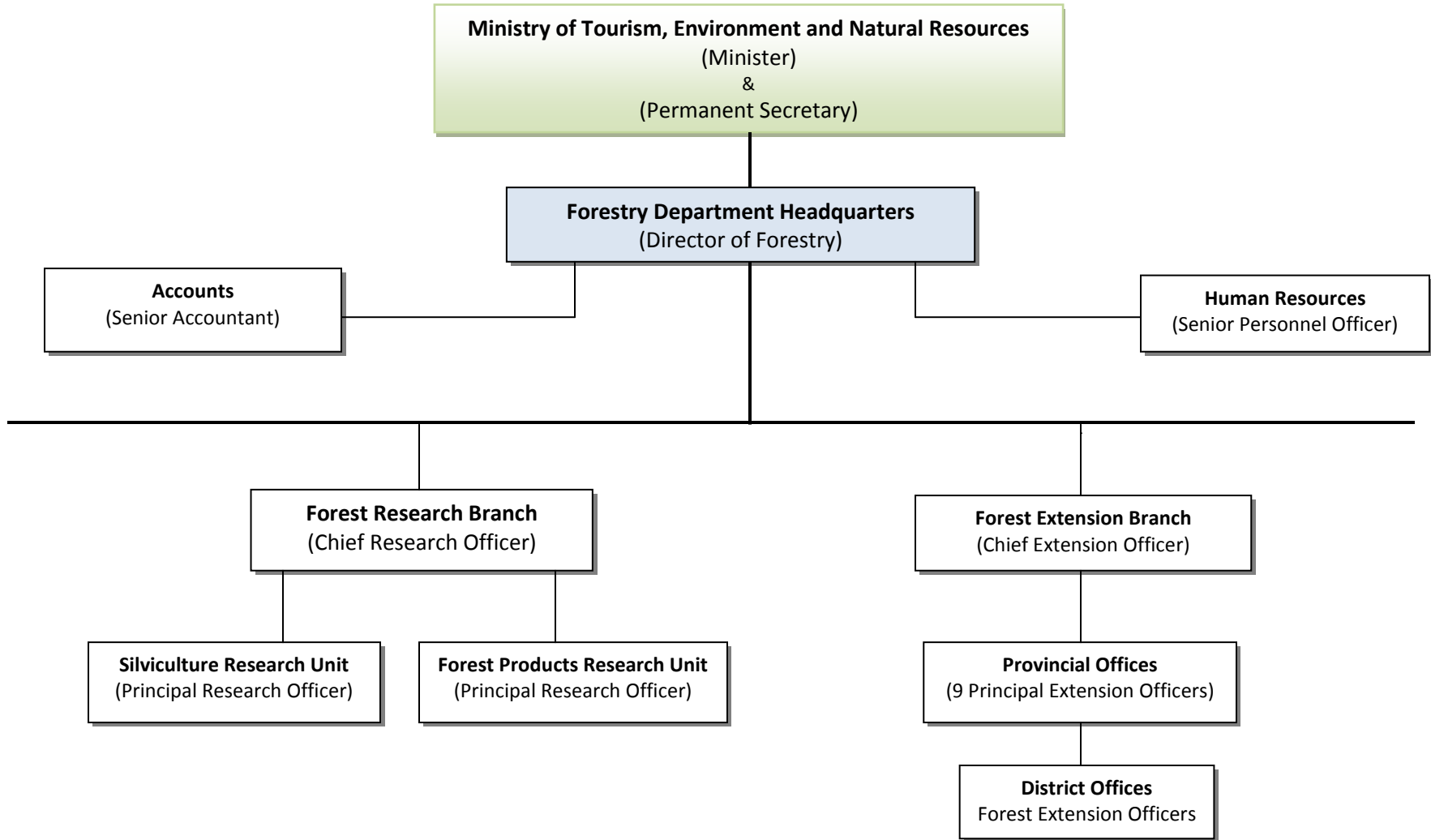
Figure 5: Forestry Department Organization Structure, before 1997.



^{1/} The Industrial Plantations Division ceased to be part of FD in 1985 when it was transformed into a parastatal called ZAFFICO (Zambia Forestry and Forest Industries Corporation Limited).

^{2/} All Districts had a forestry office.

Figure 6: Forestry Department Organization Structure, after 1997.



Poor funding to research was highlighted as a major constraint contributing to lack of updated data. There is urgent need that research be revamped to provide evidence that should contribute to informed decision making. It is important that research funds are also allocated to academia as these institutions are equally well positioned for research. Collaboration among research institutions and academia is weak, it requires strengthening.

Another area of concern relates to the weak links among the programmes under the different departments within MTENR. This feature was noted even for programmes within FD, e.g. REDD and ILUA programmes have very weak links.

Information exchange across Ministries and their departments is equally problematic. Although institutional collaboration has improved (through inter-ministerial committees) information sharing still needs attention. One way to improve this would be through online depositories which can be accessed from any remote location.

6.5 Capacity

There is a general lack of capacity in FD to respond to climate change challenges. And this situation runs across the Zambian bureaucracy. Lack of information on climate change that is suitable for different audiences is slowing down the pace for adoption of adaptation strategies and coping against climate change. Capacity building for implementing climate change related initiatives is required not only for FD but for other stakeholders too, particularly the resource poor who are most vulnerable to climate change.

6.6 Financing Mechanisms

Climate change financing is currently highly dependent on external financiers. Currently, the major ones include the FAO, UNDP, UNEP, and the Finnish Government who are supporting various programmes. The local private sector, a potential partner in this business, has not shown up yet. FD should consider engaging the corporate world to finance some of the programmes as part of their social responsibility. To this end, the best starting point would be to identify and rank areas needing financing, and then design a plan for resource mobilization and follow-up actions.

6.7 Current Initiatives on Forests and Climate Change

Various initiatives address forest management in Zambia.⁴² In particular, the ZFAP provides a national framework on forestry matters. UN-REDD, ILUA, ENRMMP projects, and the creation of CCFU are some of the examples addressing climate change issues within MTENR.

Until recently, Zambia had lagged behind in addressing climate change issues. The country heavily relied on international instruments such as Forest Principles, the Kyoto Protocol (under the Clean Development Mechanism), etc. to respond to these challenges. And this scenario has not changed much as current national programs and strategies are still supported by external funding. For instance, the CCFU under the MTENR has provided an opportunity for dialogue among different stakeholders. The Unit has produced information and data on climate change related challenges. In particular, CCFU's publications such as the *NAPA, the Information Needs Assessment and Identification of Gaps in Climate Change, the Economics of Climate Change in*

⁴² See the discussion under Background, and Mitigation and Adaptation Options.

Zambia, etc. have enhanced understanding climate change challenges in Zambia. Yet, the continuity of this initiative is not guaranteed if external funds cease to support its work.

Furthermore, other institutions have activities geared towards understanding climate change in order to develop appropriate mitigation and adaptation strategies. For instance, the National Communication Reports (1 & 2) by the ECZ; Vulnerability and Assessment Reports by the Disaster Management and Mitigation Unit (DMMU) are proving to be useful. The Meteorological Department, Ministry of Agriculture and Cooperatives (MACO), Ministry of Energy and Water Development (MEWD), UNZA, as well as various environmental and civil society organizations are also engaged in climate change related work. This is a good development only requiring enhanced collaboration.

As part of the overall goal to improve food security, while adapting to climate change, MACO is undertaking research in and promoting drought-resilient crops suitable for each of the three ecological regions in Zambia. In addition, conservation farming is being promoted vigorously.

6.7.1 Opportunities for Inter/Intra Regional Collaboration on Climate Change

International Conventions such as UNFCCC, CBD, CCD, etc. continue to provide a platform for information exchange and national experiences. Regional bodies such as SADC, COMESA, and NEPAD also offer similar opportunities through numerous programmes. For instance, Article 5 of the SADC Treaty binds members to achieve sustainable utilization of natural resource and effective protection of the environment. The SADC Protocol on forestry is even more explicit. Among other things, it demands that member states assist and support each other to address issues of common concern including deforestation, genetic erosion, climate change, forest fires, pests, diseases, invasive alien species, and law enforcement in a manner that makes the best use of the technical, financial and other resources in the Region. The SADC institutional capacity building project covers climate change issues. The Comprehensive Africa Agriculture Development Programme (CAADP)⁴³ under COMESA and NEPAD incorporates climate change considerations. At national level projects such as the UN-REDD and ILUA, which will require specialists from other sectors are likely to enhance collaboration among various agencies.

Challenges and Opportunities

- All sectors are engaged in climate change mitigation or adaptation.
- No central coordinating institution on cc, this could lead to duplication of efforts.
- Funding for climate change initiatives still heavily dependent on external financiers.
- Ongoing policy reviews a great window for incorporating climate change concerns.
- Availability of general guidelines applicable in any sector would be necessary.
(NB: Guard against looking at the guidelines as an end in itself).

7.0 SUMMARY OF KEY ISSUES FOR CONSIDERATION

The foregoing discussion has briefly highlighted the Zambian scenario with respect to forest management initiatives in general, and climate change issues in particular. One thing is clear: forests will remain a meeting focal point for addressing climate change challenges.

⁴³ NEPAD, *NEPAD Agriculture Strategic Plan 2008-2013*

Because forest conservation is a multi-dimensional and multi-sectoral undertaking, it is not possible that forestry policies alone can resolve all the problems without engaging other sectoral policies. This is because policies and strategies in other sectors do affect forestry, sometimes negatively. For instance, high unemployment, rapid population growth, adverse climatic conditions, unsustainable agricultural practices, etc. all of which have negative triggers on forest conservation are dealt with by other sectoral policies. For this reason, the npf process should not only focus on what forestry statutes can do but rather what they cannot, especially when applied in isolation from other sectors. Therefore, it is important that all sectors that impact forestry: land, agriculture, water, energy, the economy, population, industrial development, etc. be taken as part of the package.

The REDD and other approaches that holistically cover agricultural, forestry and other land use (AFOLU) do have potential for mitigating climate change and associated problems. However, unless these strategies are backed by policy, it may not be easy to have them implemented. Some of the questions worth considering are: does Zambia have the appropriate institutional and policy frameworks to take advantage of these new opportunities? How prepared is the nation to tackle the climate change problem through REDD, AFOLU and initiatives? Who will be the lead institution to coordinate climate change mitigation initiatives? With respect to the Kyoto Protocol, what has Zambia done to access funding under the Clean Development Mechanism (CDM)? What constraints, if any, are being experienced in addressing climate change issues in Zambia? Or accessing funding for the same?

While REDD is seemingly a valuable intervention towards climate change mitigation, nonetheless it comes with teething technical challenges. First, it is not easy to measure, monitor and control emissions from forests in Zambia. Will the REDD project build capacity for this? Second, no one currently knows exactly the opportunity costs of reducing deforestation, REDD benefits are currently based on speculations. In this context, how attractive REDD will be depends on comparisons of other economic benefits and opportunity costs for each piece of land. It is important to compute cost-benefits analyses as these considerations will determine the willingness of land owners to adopt climate change mitigation strategies. In its current form, Forestry Department has no institutional capacity to do all this.

Carbon trading is a new concept and commodity. The market is just starting to create itself, which currently resembles a 'talk show'. The economic value (price) of carbon is yet to be established. Who determines the price for carbon trade? Is it the resource (forest) owners, buyers, financiers or the market? Since REDD is currently financed by the rich North, what assurance is there that carbon trade will not be overtaken by powerful rich nations or their multi-national companies? What options do developing countries have to avoid the usual trap of being commodity suppliers? Will carbon financing/compensation be for governments or private landowners? And how attractive is carbon trading compared to other economic activities to which that land can be put to? These and similar economic questions have yet to be answered based on real data, which is currently not available. The market too has to create and shape itself.

Having said that, for now, REDD has the potential to address the climate change challenge. Given the global interest that has been generated and the commitment expressed from various parties supporting REDD, the proposal for a zero net deforestation by 2020 advanced by WWF in May 2008 during the 9th Conference of the Parties to the Convention on Biological Diversity (CBD COP9) seems quite possible. The world will just have to act and see [the change].

The other issue relates to land tenure arrangements. Given Zambia's dual state system on land tenure, will the traditional state be willing to release land for carbon trade? Is Forestry Department's institutional and social capital properly attuned to handle this new set of challenges?

Information and data are important inputs in any decision-making process. The current arrangements where each agency keeps their data and publications is somewhat cumbersome and ineffective. The question is: what would be the appropriate institutional arrangements to enhance information exchange across sectors? Other factors noted in this paper are presented below.

Table 12: Constraints and Opportunities for Addressing Climate Change Issues in Zambia.

Constraint(s)	Opportunities
<ul style="list-style-type: none"> ❖ Inadequate technical and institutional capacity for forest assessments and data management. ❖ No coordinating institution on climate change. ❖ Absence of alternative energy besides wood. ❖ No legal & policy framework (currently both under review) ❖ Lack of incentives for forest conservation. ❖ Forests still undervalued. ❖ Forests controlled by urban & foreign interests. ❖ Common pool resources <i>versus</i> private ownership. ❖ Land ownership, modern state <i>versus</i> traditional state. ❖ Larger population dependent on land & forests. ❖ Limited knowledge about carbon stocks and carbon markets ❖ Limited capacity to adapt to climate change. ❖ Cost-benefit & opportunity cost analyses for forest conservation not available. 	<ul style="list-style-type: none"> ❖ Forestry Policy and legislation currently under review. ❖ Multiple climate change assessments and players. ❖ Well informed NGOs and civil society. ❖ Multiple AFOLU-oriented programs. ❖ Relatively low population density. ❖ Stable & long working relationship with development partners. ❖ UN-REDD Pilot Country. ❖ Strong political will for climate change mitigation. ❖ Alternative energy sources (and technology) available: solar, bio-waste, geothermal. ❖ Political stability, peaceful nation. ❖ Well wooded nation. ❖ Strong external financial support.

Arising from the foregoing discussion, below is a summary of key issues and questions for consideration under each thematic area discussed above.

7.1 Policy Issues

- CC not covered in the 1998 National Forestry Policy (recognized in the ongoing review, Draft Forestry Policy, 2011).
- CC not integrated into ZFAP, the nfp equivalent for Zambia.
- Limited stakeholder participation in the policy process.
- Large population dependent on forests / NR, implications for forest degradation.
- Limited data & knowledge about carbon market stocks and carbon markets.

Questions (Policy)

- Should CC be integrated into ZFAP?

- Is it necessary to update ZFAP? If yes, how will the ZFAP revision be used in the REDD+ Strategy development? In ILUA? Or any other forest programs?
- Is a Climate Change Policy a must have?
- What other options are available to deal with CC?

7.2 Legal Issues

- Currently, CC not covered in the Forest Act (recognized in the ongoing legislative review)
- No legal backing for some departments in MTENR (e.g. PID and ENR),⁴⁴ what's the implication on their legal obligations?
- Tenure rights, indigenous/local community management rights.
- Transboundary conservation efforts such as trans-frontier conservation areas (TFCAs) not catered for in the current Forests Act.
- Carbon business not fully understood.

Questions (Legal)

- Are the rights for CBNRM, JFM, tenure, etc. clarified? If not, what aspects need attention?
- Is carbon trade covered under the law?

7.3 Institutional Framework

Organizational Structure

- FD too lean for the diverse actions for CC adaptation and mitigation.
- Shifting of responsibilities to local levels, does this match capacity?
- Involvement of other entities, private sector, etc. in forest management

Governance Mechanisms (Coordination)

- Unclear responsibilities
- Coordination between govt. & NGOs problematic
- Lack of incentives for forest conservation

Questions (Institutional Issues)

- What responsibilities are useful & needed at local, district, province and central level to implement CC mitigation & adaptation actions?
- Is it necessary to revisit FD's organizational structure? If yes, what should be incorporated or removed?
- Is FD effective in its service delivery under its current structure?
- What actions should be taken to improve the FD's institutional capability?

7.4 Research & Development (Communication & Information Management)

- Outdated data
- Lack of consistent research
- Poorly funded research activities

⁴⁴ These Departments are not created by an Act of Parliament.

- Cost-benefit and opportunity cost analyses for forest conservation lacking
- Weak links among programs – REDD, ILUA II

Questions (Research & Information)

- What are the priority areas needing research?
- Do research institutions collaborate with each other? If not, what actions should be taken to improve the situation?
- Carbon tax in Zambia not fully understood. What contribution is it making to mitigate climate change?

7.5 Capacity

- Capacity needs assessments
- Limited capacity to adapt to climate change.
- Lack of guidelines applicable in any sector

Questions (Capacity)

- Common pool resources *versus* private ownership. What avenue and model would be suitable to increase forest areas in Zambia?
- Does FD have capacity to coordinate multiple actors in the sector? Is the CBNRM/JFM model yielding the anticipated results?
- Given FD's current capacity, what would be the best model for forest governance?

7.6 Financing Arrangements

- Climate change financing highly dependent on external financiers
- Local private sector not yet engaged in green financing

Questions

- What are the priority areas that require financing, in order of priority?
- What would be the concrete follow-up steps required?

8.0 CONCLUSION

Climate change impacts are real and, therefore, require practical interventions to deal with the problem. While there are many challenges in developing, implementing, monitoring and evaluating programmes that offer real value to the target groups, the emphasis on participatory approaches embedded in the nfps to identify forestry sector problems and propose solutions for the same may offset such challenges. Stakeholder round table meetings such as this National Workshop provide a great platform for consensus building and project ownership. NFPs are likely to become a great tool for addressing nation specific issues related to sustainable forest management and, climate change mitigation.

Expert assessments suggest that climate change related problems will continue to manifest for decades to come. Therefore, the best each country can do is to be in a state of preparedness by developing mitigation and adaption strategies. The National Adaptation Program of Action (NAPA) on Climate Change and the National Climate Change Response Strategy (NCCRS-2010) respond to this challenge.

Since national policy dictates action, the ability to integrate climate change issues into national policies and programmes brings such preparedness closer to being a reality. Indeed, government has a vital role to play in policy formulation and, more importantly in resource mobilization, to finance national programs that mainstream climate change. By adopting greener technologies, the private sector would contribute positively towards addressing climate change.

It is evident that Zambia is taking steps to address climate change challenges through various interventions, most notably by adopting REDD+ and AFULO strategies. However, these initiatives should not just be for climate change mitigation, rather they should be taken as an opportunity to enhance national development. Furthermore, local community concerns and priorities must inform the decisions taken. In terms of policy, the government of Zambia has been consistent in its forest conservation efforts. The National Conservation Strategy (NCS) which became the first national framework for natural resource conservation, including forests was promulgated in 1985. Nine years later, a National Environmental Action Programme (NEAP, 1994) was developed. The NEAP provided a policy framework for environmental management and also paved way for a series of National Action Plans for specific resources. In terms of forest management, there is the Provincial Forestry Action Plan (PFAP), Zambia Forestry Action Plan (ZFAP), and the National Action Plan to combat desertification. The ZFAP is equivalent to a national forest programme. However, lack of actual implementable programs from these Action Plans has rendered them ineffective and negates the rationale behind all these National Action Plans (NAPs). These action plans were supposed to be springboards to action! However, now there is hope that this nfp process would pick up the pieces.

Finally, addressing climate change challenges will certainly require financing. However, under the current regime climate change financing is highly dependent on external financiers. It would be useful and even timely to bring on board the local private sector, which is not yet engaged in green investment. In terms of climate change management the NAPA, NAMA, NCCSR are good pillars for CC integration. Mainstreaming CC in other sectoral statutes would be a better and more effective strategy coupled with having a coordinating body on CC. Improvement in information management system(s) and clarity on issues relating to carbon trade and carbon markets are critical in this process.

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ANNEXES

ANNEX 1: SECTORAL POLICIES RELEVANT TO FOREST MANAGEMENT.

POLICY	KEY PROVISIONS	CLIMATE CHANGE STATUS
National Land Policy (Land Administration & Management Policy 2006)	Overall vision is to provide for secure, fair, and equitable access and control of land for sustainable socio-economic development to the Zambian people by 2015. Recognizes the challenges faced in land and natural resources management and, provides measures to enforce good land use practices.	Climate change issues not covered. The policy acknowledges environmental degradation and notes that land ownership & rights ought to promote certain controls such as woodland and wetland conservation frameworks that involve local institutions in land management activities.
National Agricultural Policy 2005	Vision: To promote development of an efficient, competitive and sustainable agricultural sector that ensures food security and increased income. Seeks to address unsustainable practices in the agricultural sector. The main focus is to increase production; commercialize & liberalize the sector, and promote public-private partnerships to enhance effective service delivery that will ensure sustainable agricultural growth.	Does not cover climate change challenges.
National Energy Policy 2008	Reviewed the 1994 Energy Policy which promoted private sector participation in the energy sector. The 2008 Energy Policy addresses energy issues by promoting alternative energy sources and introduction of new energy efficient technologies.	Does not cover Climate Change issues explicitly, but indirectly under Environment (p.31). The policy seeks to reduce consumption of Woodfuel; increase utilization of other alternative renewable energy sources; and reduce greenhouse gas (GHG) emissions from the energy sector.
National Water Policy (February 2010)	Vision: increased access to water supply and sanitation through integrated and efficient water management. Addresses salient issues not covered in the Water Resources Policy of 1994 such as new developments pertaining to the MDGs; Poverty Reduction Strategy Paper; and the Decentralization Policy. The National Water Policy will run for 10 years (2010-2020).	The Policy covers climate change concerns. Intends to conduct public awareness on climate change impacts, mitigation and adaptation measures; Assess and monitor climate change impacts on the ecosystems, particularly on woodlands/forests and wetlands; Promote alternative sources of energy to fuelwood; and to strengthen national climate & meteorological databases and monitoring networks.
National Wildlife Policy, 1998	Mission: to promote sustainable use of wildlife resources. Provides for integrated management of National Parks and Game Reserves through collaborative planning that involves key stakeholders.	Does not cover climate change challenges.
DRAFT Fisheries Policy	Aims at improving the efficiency of the national fishing industry, the production and supply of fish	Does not cover climate change challenges.

	<p>products and, development of new products to satisfy local and potential export markets.</p> <p>Focuses on monitoring and controlling fishing activities to enhance the quality of life for fishing communities through sustainable fish yields; promoting aquaculture as a source of income and, promoting participatory fisheries management approaches.</p>	
<p>Mining Sector Policy</p>	<p>Overall goal: To ensure sustainable exploitation of Zambia's mineral resources for socio-economic development, and equitable sharing of the financial and developmental benefits between investors and Zambian people.</p> <p>The Policy is aligned with the FNDP: anticipated to have a vibrant well organized private sector contributing more than 20% to national GDP and providing sustainable employment.</p> <p>The policy sets 15 objectives supported by strategies.</p>	<p>Does not cover climate change challenges.</p>
<p>National Decentralization Policy of 2002</p>	<p>Introduces the devolution of administrative and political authority from central government to district level and, integrates government agencies at district and local level into one administrative unit.</p> <p>The focuses on improving both governance and service provision at local government levels. It is part of the broader policy framework to reform the public service.</p> <p>Vision: To have a fully decentralized and democratically elected system of governance characterized by open, predictable and transparent policy making and implementation processes; effective community participation in decision-making; development and administration of their local affairs while maintaining sufficient linkages between the centre and the periphery.</p> <p>The policy provides eight (8) objectives and corresponding strategies to achieve the same.</p>	<p>Does not cover climate change challenges.</p>

ANNEX 2: SECTORAL LEGISLATION RELEVANT TO FOREST MANAGEMENT

LEGISLATION	KEY PROVISIONS	CLIMATE CHANGE STATUS
Agricultural Lands Act, No. 65 of 1965, CAP187.	Establishes the Agricultural Lands Board, and provides for tenant farming schemes.	Does not provide for climate change interventions.
Lands Act, No. 29 of 1995, CAP 184.	All land in Zambia vested in the Republican President on behalf of the Zambian people. The Lands Act provides for leasehold tenure. Maintains the continuation of customary tenure, and provides for conversion of customary tenure to leasehold tenure of 99 years. Also establishes a Land Development Fund, and a Lands Tribunal to deal with land disputes.	Does not provide for climate change interventions.
Water Act, No.34 of 1948, CAP 198. Water Resources Management Bill, 2010	The Water Act provides for ownership, control and use of water resources. Has various amendments to incorporate new issues of the day. Replaces the Water Act, Cap 312 of 1949. The Bill awaits Presidential consent. The 2010 Water Bill proposes the creation of a Water Resource Management Board.	No provisions for climate change interventions. The 2010 Water Bill incorporates climate change considerations.
Electricity Act, 1995, CAP 433. Rural Electrification Act, No. 20 of 2003 Energy Regulation Act, No. 15 of 1995, CAP 436. (effective 1997) Petroleum Act, CAP 435	The Act regulates hydro-power generation, transmission, distribution and supply. This Act is currently under review, scheduled to be finalized this year (2011). Establishes the Rural Electrification Authority and Rural Electrification Fund. It provides for electricity supply to rural areas to support the development of agriculture, mining, and other economic activities. The Act is intended to enable more people access clean energy. If implemented widely this Act could reduce demand for wood energy and subsequent pressure on the forests. The Act establishes the Energy Regulation Board (ERB), provides licensing guidelines for the production of energy and handling of certain fuels. The ERA repeals the National Energy Council and the Electricity Supply Act. Regulates matters incidental to petroleum energy. Major components of the Act are covered under the Energy Regulation Act of 1995, essentially rendering the Petroleum Act obsolete.	None of these energy related Acts provides for climate change interventions.
National Parks & Wildlife Act, No. 12 of 1998, CAP 201.	Provides for the establishment, control and management of National Parks and, for conservation and protection of wildlife, objects of aesthetic, historical and scientific value. Includes regulation of game ranching, licensed hunting and control of processing, transfer, sale, import and export of wild animals and	Does not provide for climate change interventions.

DRAFT National Parks & Wildlife Bill, 2008	<p>trophies. Promotes co-management of wildlife; local community participation and benefits sharing from wildlife resources.</p> <p>The new Bill seeks to review the 1998 NPW Act; to provide for implementation of international conventions (e.g. CBD, RAMSAR and others related to wetlands management); and to reclassify wildlife conservation areas.</p>	Climate change considerations likely to be included.
Fisheries Act, No.22 of 2011, CAP 200.	<p>Repeals the Fisheries Act, No. 21 of 1974, CAP 200 which controlled fishing and provided for the development of commercial fishing in Zambian lakes and rivers; and registration of fishermen and their boats.</p> <p>The new Act provides for sustainable development, management, conservation and utilization of fisheries; establishment of fisheries management areas and committees; regulation of commercial fishing and aquaculture; and the establishment of the Fisheries and Aquaculture Development Fund.</p> <p>The main purpose of the Fisheries Act is to promote fishing at sustainable yields.</p>	Does not provide for climate change interventions.
Mines and Minerals Act, No. 31 of 1995	<p>Provides for prospecting for and mining minerals. Vests all rights of ownership in searching for, mining, and disposal of minerals in the Republican President. License holders required to, <i>inter alia</i>, conduct studies on the impact of mining operations on the environment and ways and means of eliminating or minimizing any adverse effects.</p>	No provisions for climate change interventions.
Local Government Act, No. 22 of 1991	<p>Repeals the Local Administration Act, and provides for an integrated three tier local administration system. It defines the functions of local authorities.</p>	No mention of climate change.

ANNEX 3: BUDGETARY ALLOCATION TO CC RELATED INTERVENTIONS.

Sector and 2009 Budget (ZMK Billion)	Programmes	2009 Budget (ZMK Billion)	Proposed % increase in Budget for 2010	Proposed 2010 Budget (ZMK Billion)
Agriculture (6.565)	Crop diversification	0	5	7.454
	Water Resource Development for Irrigation	0.74	10	
	Smallholder Irrigation Schemes	4.96	10	
	Informal Irrigation Development	0	5	
	Conservation Farming	0.87	10	
	Agroforestry Promotion	0	10	
Fisheries (1.0)	Aquaculture Development	0	15	1.15
Environment and natural resources (1.226)	Education and Public Awareness	0.27	19	1.459
	Coordination of Implementation of Projects/Programmes	0.34	18	
	District Community Environment and Natural Resource Management Support	0.62	20	
Forestry (0.074)	Strengthening Community Based Forest Management	0.07	20	0.085
	Agroforestry and Afforestation	0	12	
	Protection and Management of Catchment Forests	0	12	
Energy (1.888)	Bio-fuels development	0.43	9	2.21
	Energy Efficiency and Conservation	0.39	16	
	Renewable & Alternative Energy Development and Promotion	1.1	25	
Water (11.810)	Water Resources Development for Productive Use and Infrastructure Development	9.98	40	14.74
	Water Resource Management and Information Systems	1.84	10	
DMMU (Resettlement Department) (1.055)	Scheme Infrastructure Development (Water supply improvement in the face of droughts)	0.88	20	1.308
	Human Settlements (for people affected by floods)	1.79	28	

Adapted from Abraham Makano, *National Budgeting Tracking in Relation to Climate Change*, (2011:5).

ANNEX 4: GOVERNANCE INDICATORS, ZAMBIA

Kaufmann, *et. al.*, (2009) broadly define governance “as the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them.”⁴⁵ They measure governance against six indicators, Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. On a scale of zero to one, Zambia is ranked as shown below.

	2008	2007	2006	2005	2004	2003	2002	2000	1998	1996
	Est. S.E. N	Est. S.E. N	Est. S.E. N	Est. S.E. N	Est. S.E. N	Est. S.E. N	Est. S.E. N	Est. S.E. N	Est. S.E. N	Est. S.E. N
Voice & Accountability	-0.09 0.12 15	-0.23 0.12 14	-0.31 0.14 14	-0.48 0.15 11	-0.38 0.16 11	-0.35 0.17 9	-0.36 0.17 8	-0.41 0.22 5	-0.49 0.23 5	-0.49 0.23 4
Political Stability	0.29 0.21 10	0.14 0.21 10	0.13 0.21 10	-0.11 0.22 9	-0.10 0.22 10	-0.23 0.21 9	-0.45 0.21 8	-0.50 0.24 7	-0.22 0.22 7	-0.59 0.29 6
Govt Effectiveness	-0.66 0.17 13	-0.62 0.16 14	-0.73 0.15 14	-0.92 0.16 12	-0.82 0.14 13	-0.85 0.14 12	-0.81 0.16 11	-0.96 0.18 7	-1.06 0.13 7	-0.70 0.26 5
Regulatory Quality	-0.33 0.16 11	-0.52 0.16 12	-0.59 0.16 12	-0.63 0.16 11	-0.56 0.16 12	-0.58 0.17 11	-0.62 0.20 10	-0.16 0.23 7	-0.01 0.24 7	0.34 0.33 5
Rule of Law	-0.50 0.14 17	-0.59 0.14 17	-0.63 0.14 16	-0.57 0.15 14	-0.58 0.14 16	-0.63 0.14 13	-0.49 0.15 12	-0.55 0.15 9	-0.58 0.18 9	-0.60 0.24 6
Control of Corruption	-0.48 0.15 15	-0.59 0.14 13	-0.74 0.15 14	-0.77 0.16 12	-0.86 0.15 12	-0.88 0.17 10	-0.98 0.18 9	-0.94 0.20 7	-0.92 0.21 7	-1.09 0.27 4

Note: “Est.” refers to estimate, “S.E.” refers to standard errors, and “N.” refers to number of sources. The standard errors have the following interpretation: there is roughly a 70% chance that the level of governance lies within plus or minus one standard error of the point estimate of governance.

Source: Kaufmann, Daniel; Aart Kraay & Massimo Mastruzzi (2009), *Governance Matters VIII: Aggregate and Individual Governance Indicators 1996–2008*. World Bank, June 2009.

1. Voice and Accountability (VA)

Captures the general perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as the freedom of expression, freedom of association, and a free media.

2. Political Stability and Absence of Violence (PV)

This covers perceptions of the likelihood of the government being “destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.”

3. Government Effectiveness (GE)

This relates to perceptions about the quality of the civil service, quality of public services, and the degree of government’s independence from political pressures, including the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

4. Regulatory Quality (RQ)

This indicator captures perceptions regarding government’s ability to formulate and implement sound policies and regulations that permit and promote private sector development.

⁴⁵ Kaufmann, *et. al.*, *Governance Matters VIII*, 2009:5-6

5. Rule of Law (RL)

Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

6. Control of Corruption (CC)

Captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.⁴⁶

⁴⁶ Kaufmann, *et. al.*, *Governance Matters VIII*, 2009:5-6

ANNEX 5: LIST OF PEOPLE CONSULTED

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