



THE REPUBLIC OF ZIMBABWE

FORESTS, RANGELANDS AND CLIMATE CHANGE ADAPTATION IN ZIMBABWE

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1.0 Introduction

1.1 Geographical Location of Zimbabwe

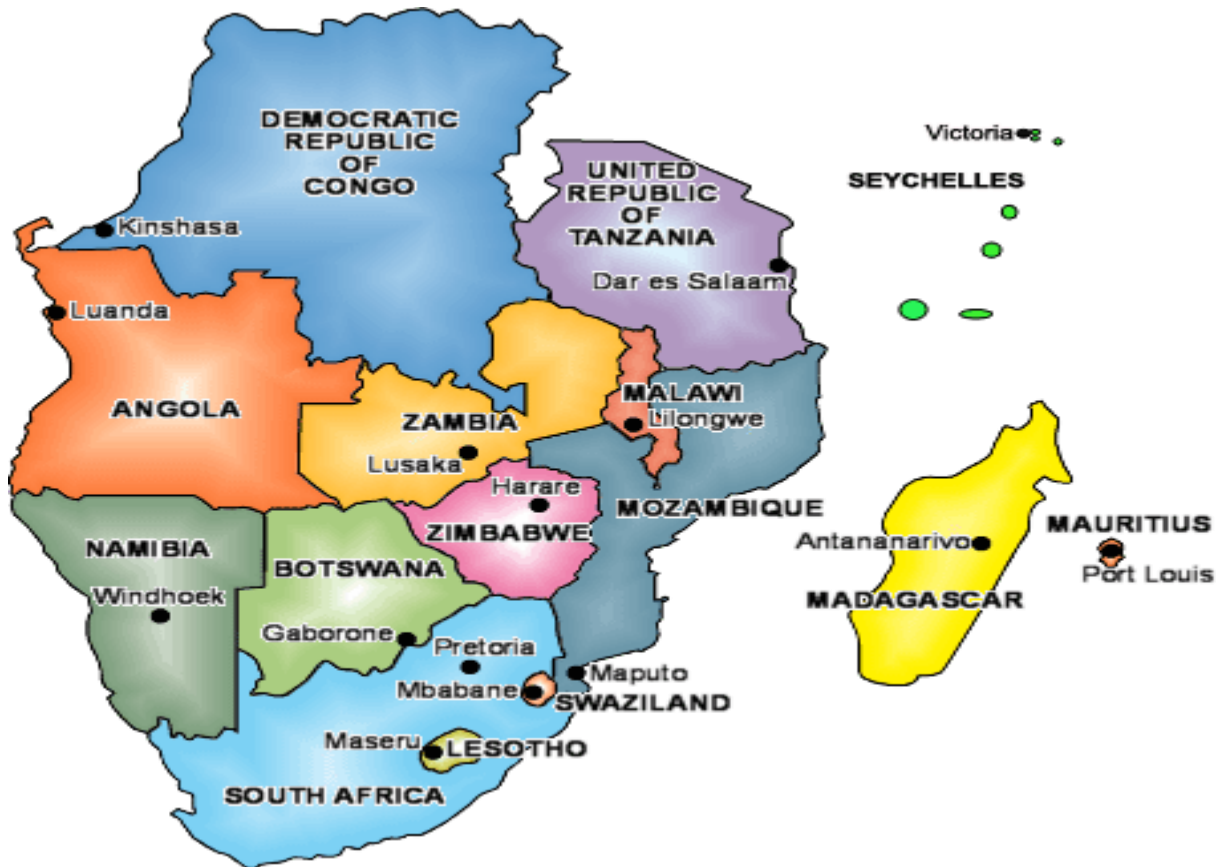


Fig 1 Zimbabwe Geographical Location in Southern Africa
Source: SADC

Fig 1 shows Zimbabwe's geographical location relative to her neighbouring countries in southern Africa. Zimbabwe is a land locked country located in southern central Africa with land area of approximately 390 750 square kilometers (km²), translating to 39.075 million hectares in extent. According to the 2012 Zimbabwe State of Forest Genetic Report to Food and Agricultural Organisation of the United Nations (FAO), of this land mass, about 69% is covered by forests and rangeland where forests and woodlands constitute 42% while protected park and other conserved sites 13% while rangeland grassland account for 14%. The Country shares borders with four of her neighbours with Zambia in the north; Botswana in the west; Republic South Africa in the south; and Mozambique in the north-east, east and south-east. The population is estimated to be about 12million (National Census, 2012). Zimbabwe is part of the global village in the Africa sub-region and is a member of the Southern African Developed Community (SADC).

Zimbabwe experience two seasons namely, the dry season (May to October) and the rain season (November to April). Vulnerability and impacts on her economic activities arising for climate change effects are clearly highlighted and discussed extensively in the Country's Second National Communication to the UNFCC on Climate Change.

1.2 Role of Forests and Rangelands

While the role of forests and rangelands are almost universal the world over, in Zimbabwe forests and rangelands provide a source of goods and ecosystem services, mostly for rural communities who constitute close to 70% of the population estimated to be about twelve million as per the National Census (2012). In the last decade or two, forest and rangelands have been subjected to intense pressure for both space and provision of goods and services for human livelihoods especially during periods of desire needs caused primarily by climatic variability and the socio-economic demands which more often exceed supply of products, goods and services. For Zimbabwe, the more vulnerable are the rural poor communities who rely for their livelihood on forest and rangeland based products, goods and services. This sector of the population a victim of periodic droughts, floods, pests and diseases causing poverty as they would fail to provide themselves with enough food, shelter and sometimes adequate health facilities and safer water for both domestic and industrial use.

Faced with these global, regional and local challenges related to climate change dynamics, Zimbabwe like other vulnerable nations has responded positively by committing resources mobilized either locally or from global cooperating partners, to mitigation and adaptation measures to combat climate change effects. Due financial and resources challenges Zimbabwe is lagging behind in her efforts to adapt to the effect of climate change. However, Zimbabwe accords adaptation top priority when it comes to combating the adverse effects of climate change and its challenges.

1.3 Climate Change Vulnerability and Impacts

Zimbabwe considers global climate change a serious issue dating back to UNFCC Rio Earth Summit of 1992 and was one of the first countries to ratify the Convention in the same year as reported in the Second National Communication (2012). Zimbabwe experience two seasons namely, the dry season (May to October) and the rain season (November to April). Vulnerability and impacts on her economic activities arising for climate change effects are clearly highlighted and discussed extensively in the Country's Second National Communication to the UNFCC on Climate Change.

The most vulnerable socio-economic sectors included: **agriculture, rangeland, water, biodiversity, health and human settlement.**

1.3.1 Rangelands and forests

In Zimbabwe rangeland are for timber and livestock as well as wildlife production covering close to 23.3 million hectares (Fig 2). National Parks alone cover about 5.4 million hectares, represent 13.1% of total land size, while rangeland grassland for livestock production is estimated at 1 439 589 ha (3.6%) while forest and woodland constitute 16 544 355ha (42.3%), of which 843 297ha (2.2%) is protected. National Park areas protected include sanctuaries, safari areas, botanical reserves, gardens and leisure recreation areas. In total, close to 60% of country is wooded (Table 1). Vulnerability to climate change would result in a decrease in timber, as well as livestock and wildlife production due to reduced rangeland carrying capacity, especially in the northwest and south-western parts of Zimbabwe which are prone to droughts, pests, and disease and veldt fires. In the case of livestock and game, adaptation measures would include supplementary feeding water provision.

Table 1: Forests, Rangeland and Parks Areas in Zimbabwe

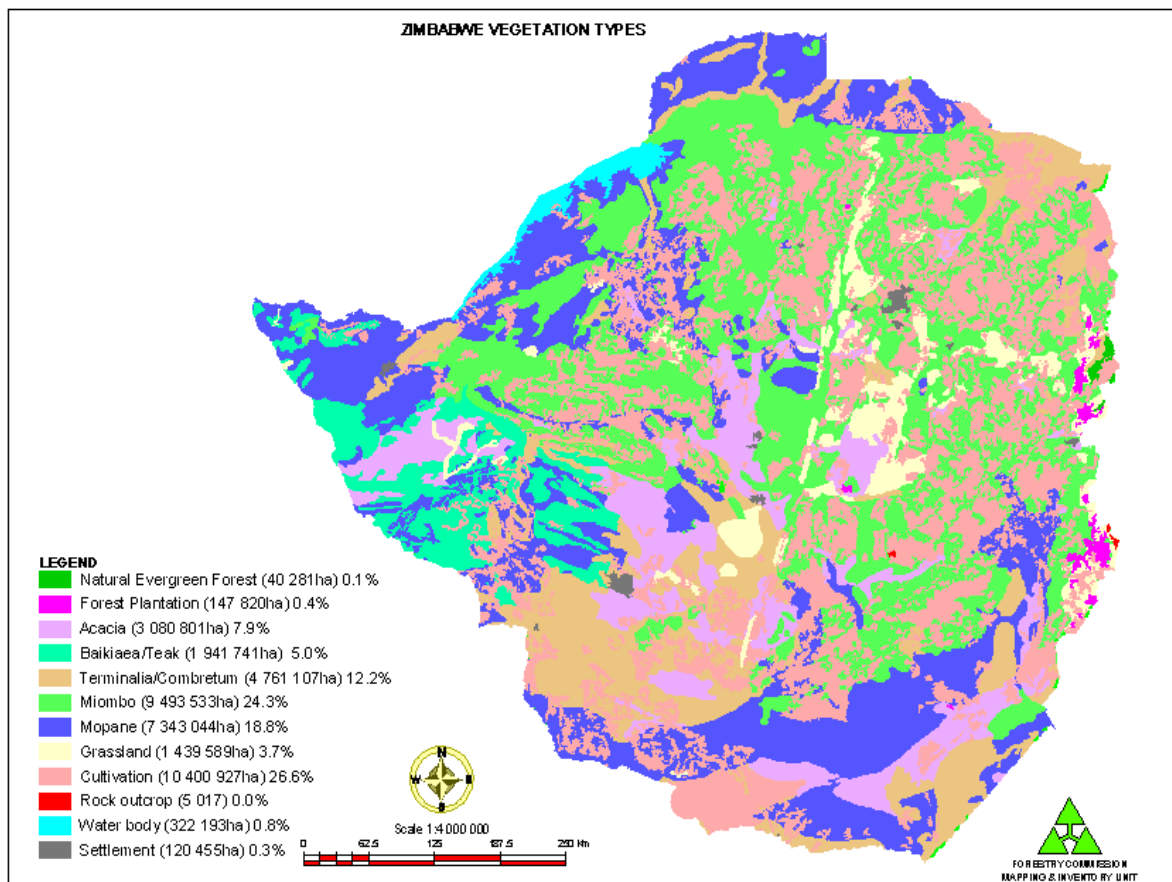
Activity	Area (Million ha)	% of total land area
Forests and Woodland	16.5	42.3
Park and Conservancies	5.4	13.1
Rangeland and Savanna Grassland	1.4	3.6
Sub-total	23.3	59.9
Cultivation	10.4	26.6
Settlement	0.1	0.3
Other	5.3	13.5
Sub-total	15.8	40.4
TOTAL	39.1	100.0

Source: Forestry Commission, VegRIS Reports, 2002, 2008

1.3.2 Biodiversity

Plant biodiversity is sensitive to rainfall and temperature regimes. Zimbabwe experiences a tropical dry climate. The forest ecosystem and agriculture sectors suffer the most, especial given that Zimbabwe is prone to moisture and water deficiency as a result increasing frequency of droughts or short rain seasons, in the past decade, and also occurrence of extreme events such as floods experienced like that in year 2000. Studies conducted in the country have shown direct strong correlation between increase in temperature and decrease in precipitation that impact negatively on plant biodiversity as reported in the National Communications to the UNFCCC(1998, 2012). In the 2012 communication, it is predicted that by 2080, areas which currently have high concentration of plant biodiversity will shrink, partly due to climatic variability and, to some extent, unsustainable human activities. Fig 3 shows some of the badly degraded and deforested areas that need urgent rehabilitation to restore depleted biodiversity. This is good enough an indicator that Zimbabwe's adaptation and mitigations strategies should focus on minimizing anthropogenic disturbances and unsustainable utilization of biodiversity, with emphasis on conservation of threatened plant biodiversity and avoiding their over-exploitation.

Fig 2: Forests and Rangelands



Source: Forestry Commission

1.3.3 Water

Given erratic and inadequate rain/precipitation, Zimbabwe is already feeling the impact of this in the form of inadequate run-off into water reservoirs/dams as well as water table reduced re-charge or disappearance. This is already being experienced in the Save and Umzingwane and Shashe catchment areas. Urban areas and the agricultural sector are the most hit and feel the impact the most.

Adaptation – improving water use efficiency in agriculture and urban centres, and water harvesting and dam construction.

1.3.4 Agriculture

Zimbabwe is an agri-based economy with maize, tobacco, cotton and small grains and livestock dominating agricultural activities in the country. The Second National Communication to UNFCCC (2012), and studies on coping with drought (Unganai, 2012), have shown that the area suitable for maize which is the staple food-crop, has decreased and will continue to decrease in future. Because small grains were found to be more

resilient to climate change variability, current and future efforts in crop production will focus on cultivation of small grains as a strategy to ensure food security.

1.3.5 Health

Zimbabwe is prone to the incidence of the malaria vector, especially in hot low lying environments such as the south east low veld (Chiredzi, Beitbridge) and the Zambezi escarpment in the north, are the most vulnerable. Scientists have predicted high probability of malaria in these areas by to 2080 (Zhakata, unpublished). Malaria is one of the diseases linked to climate change particularly in Zimbabwe and other humid and dry tropical countries. As an adaptation strategy, Zimbabwe has prioritized increasing the number of adequately equipped health centres countries in such vulnerable areas and to ensure that these are adequately resourced.

1.3.6 Human Settlement

Rural settlement and urbanization sectors depend directly on the performance of the other economic and environmental sectors. Vulnerability levels of these other sectors impact directly on human settlement and urbanization in that they heavily depend on environmental goods and ecosystem services. For example, the direct impact on socio-economic well being arising from the negative effects on agriculture, rangelands/forests, health, water resources and biodiversity will automatically make the human element highly vulnerable. Consequently, any adaptation measures for this sector will invariably depend heavily on adaptive capacity of the other sectors to climate change variability

2.0 NATIONAL PRIORITY ACTIONS FOR ADDRESSING CLIMATE CHANGE IN FORESTRY

According to the National Communication Report to the UNFCCC (2012), Zimbabwe's forestry resources constitute about 23.3 million ha (60%) of the total Zimbabwe's land area. Of this, 16.5 million are forests and woodlands (42/3%) and 1.4 million ha (3.6%) are rangeland, excluding park areas as summarized in Fig2 and Table 1. These statistics speak loud enough about Zimbabwe being a potential carbon sink (Fig 2). Major changes in forest cover occurred between 1992 and 2008, as reported in the National State of Genetic Resources (Forestry Commission, 2011) where there was a decrease from 53.2% to 42.3%. Forestry and other plan resources succumb to the negative effects of climate change especially those related to rainfall, pests and disease, veld fires and anthropogenic activities. Much of Zimbabwe depicts many areas being deforested and degraded (Fig 3) and one of the major contributors are veldt fires where about a million hectares are lost annually. Loss of forest resources is estimated at 327 000 ha annually at a rate of close to 1.8% per annum (State of Forest Genetic Resources report, Forestry Commission, 2011).

In response to the state of forests, national priorities to addressing climate change include:

(a) Afforestation and reforestation programmes

Over the last three decades, Zimbabwe through its Forestry Commission has been on a massive tree planting programme nation-wide, and since 2005 were averaging 8.1 million trees planted with a survival rate of about 65 to 70% for those planted. This is has been achieved through initiatives such as the national tree planting day (NTPD), schools tree growing and tree care competitions and also at special commemoration such as International Forest Day, World Environment Day and so on. The private sector and other cooperating partners that include non-governmental organizations/agencies and multilateral agencies such as UNDP and FAO as well as local community groups participate actively in afforestation and reforestation.

(b) Awareness programmes on climate change and value of forest resources

Zimbabwe through its agencies such as the Forestry Commission and Environmental Management Agency guided by their environmental mandates as supported by their relevant statutes carry environmental education and awareness activities to promote conservation and protection of forests, management and their sustainable utilization. The country has a fire management policy and strategies thereof which focus on fires prevention and fire management.

(c) Development of climate change resilient tree variety

The Forestry Commission, as the forest authority (Forest Act, Chapter 19:05) is spearheading a research programme to develop fast growing tree species of both pine and eucalyptus which are drought and pest resistant and suitable for the anticipated climate variability. Five crosses of pine and 3 crosses of eucalyptus have been developed. Field trials have been established to further explore studies on matching the species to sites and productivity as an adaptation strategy to climate change.

(d) Conservation and management of natural resources

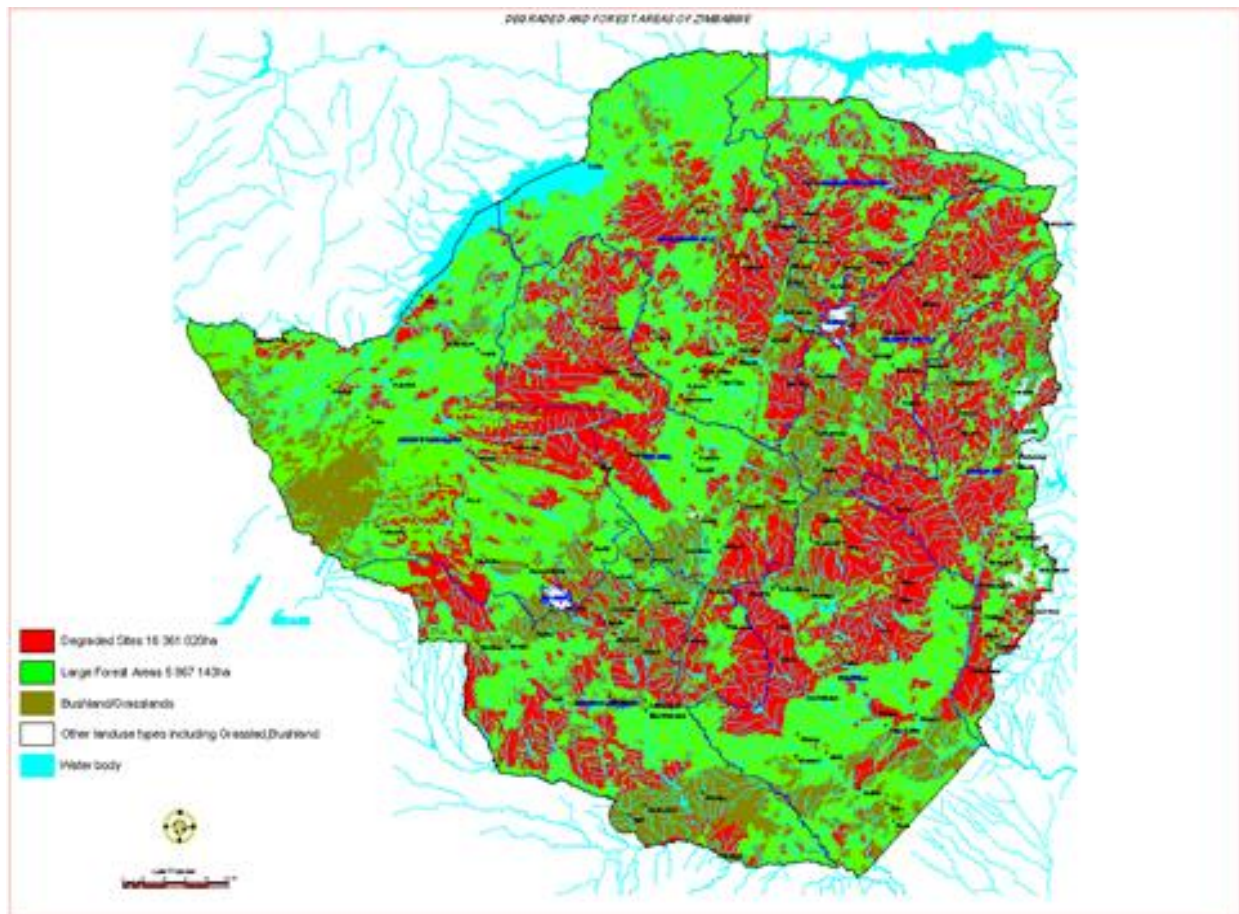
The programme is being strengthened and stepped up to manage and conserve indigenous forests which are host to a wide variety of forest biodiversity. This has been expanded to the existing 830 000 ha natural forests currently under protection to include woodlands and wooded grasslands. For these, adaptation measures include restoration of deforested and degraded land, zero tolerance to anthropogenic disturbances such as overexploitation of plant biodiversity.

Fire management strategies and environmental policies and other environmental protection laws have been put in place to mitigate against loss of forests and rangelands (Zimbabwe Environmental Policy, 2003, Statutory Instrument 116 of 2013) to ensure that the ecosystems continue to provide goods and environmental services on a sustainable basis. As an adaptation strategy for the conservation of forest and rangeland ecosystems, Zimbabwe has prioritized both ex-situ and in-situ conservation and expanded this effort to forest ecosystems outside traditional protected conservation areas. This calls for local authorities and traditional leaders to participate in identifying such new sites to be proclaimed conservation areas.

(e) Reducing Emissions from Deforestation and forest Degradation Programme (REDD⁺)

Zimbabwe is signatory to a number of multilateral and regional environmental agreements (MEAs) protocols, chief among them, are UNFCCC, Kyoto, CBD, UNCCD and SADC protocols on forestry and wildlife management. Under the UNFCCC process, Zimbabwe has adopted REDD⁺ approaches as a tool for climate change mitigation and ecosystem conservation. The objective is to enhance carbon stocks thereby conserving and expanding area covered by forests and rangelands. Zimbabwe nationals have participated at a number of REDD and climate change workshops in the region and at international for a. In February 2013, a national REDD⁺ readiness workshop was held and issues that emerged paved a way forward for Zimbabwe on REDD⁺ as a mitigation and ecosystem conservation strategy to increase the stock levels of forest carbon resource base. Meanwhile, a National Climate Change Response Strategy is being finalized in which a wide range of other climate change mitigation and adaptation approaches will be brought to the fore.

Fig 3: Degraded and deforested sites (Areas shaded in red colour are the most affected)



(Source: Forestry Commission)

3.0 KEY GAPS, CONSTRAINTS AND CHALLENGES IN ADDRESSING CLIMATE CHANGE

(a) Gaps

Major gaps in forest and rangeland management include issues related to knowledge and information management, technical capacities and financial considerations. In Zimbabwe most prominent gaps include;

- (i) Information on the value and roles of forests and rangelands in environmental protection. Often these resources (trees and wildlife) are considered “God-given” and as such are a common good that will be there forever.
- (ii) Education curricula across the board, primary to tertiary level are silent on the forest discipline as one of the important economic sectors.
- (iii) Lack of up-to-date and accurate data on forests and rangelands due to weak inventory methodology. Zimbabwe has not yet developed a robust information management system to monitor its forestry and rangeland resources.
- (iv) Limited accurate national accounting to capture the direct contribution of forest and rangeland resources to the economy and any attempts has proved to understate the true value.

- (v) Lack of awareness by a large section of the population and failure to link forest and rangeland resources to climate change related issues.
- (vi) Zimbabwe has yet to produce its Climate Strategy and Policies to guide the development of forest and rangeland sectors. It is not clear what priority level these have been set.
- (vii) At the moment Zimbabwe has no accurate information on the level of carbon stock stored in forests and rangelands. There is need to build capacity in this area.
- (viii) Funding gaps continue to widen difficult to narrow down between needs and financial resources available. This gap has made Zimbabwe's efforts futile when it comes to implementing forest and rangeland protection programmes, for example, control of fires and illegal activities such as poaching of timber and wildlife.

(b) Constraints

Constraints hinge on technology, finance, knowledge and skills considerations;

- (i) Modern principles and methodologies for effect sustainable forest and rangeland management. Knowledge and skills are usually outsourced at the international markets and are not cheap. The forest sector gets allocation of less than 1% annually from the National Treasurer and is usually inadequate to meet the needs of the sector.
- (ii) Education, awareness and information dissemination need a sustainable funding base.
- (iii) Technology transfer requires relevant skills and these skills are limited, for example quantification of forest resources is best done using GIS/Remote sensing technology that requires specialist training and tools not available in Zimbabwe.
- (iv) Given the long term nature of forestry and rangeland business in the form of timber, wild life and livestock, return on investment take long to be realized. This may result in such business failing to attract investment. This constraint has seen the sector losing skilled human capital to other sectors.
- (v) There is limited research capacity to understand and improve the ecology and conservation of forests and rangelands.

(c) Challenges

Technology transfer, financing, anthropogenic and the land tenure system in Zimbabwe are some of the challenges derailing efforts in trying to address climate change issues.

- (i) The technologies recommended for adopting IPCC/UNFCCC methodologies are either expensive to procure or complicated to use. Training required to acquire the relevant skills is not cheap.
- (ii) Unsustainable human activities are a major hindrance to efforts to address environmental issues such as deforestation, land degradation and greenhouse gas (GHS) emissions.
- (iii) The land tenure system where the large part of (70%) is classified communal compromises ownership and accountability and this does not complement climate change mitigation initiatives especially in state forest and rangeland areas.
- (iv) Level of awareness on the effects climate change among communities is low. Outreach campaigns on environmental and ecosystem conservation have not reached every corner of the country, save for urban communities who have access to radio and television.
- (v) Forest and veldt fires negate biodiversity and ecosystem conservation as well as efforts to combat deforestation and land degradation.
- (vi) Climate change is a new phenomenon and requires well-coordinated training and outreach programmes that are supported a reliable information dissemination system.

4.0 ASSISTANCE REQUIRED FOR CLIMATE CHANGE ACTIONS

As a developing nation, Zimbabwe requires

- (i) Adequate and predictable financing and technology transfer to support climate change mitigation and adaptation programmes. The support may be in the form of funding to support various climate change actions such as awareness and education, adaptation and mitigation projects.
- (ii) Zimbabwe needs assistance to formulate bankable climate change related projects and strategy development of related policies.
- (iii) Technology and skills development are key in order to be able to implement climate change actions such as conducting forest resource inventories and carbon stock assessment. This would require sophisticated computer hardware and GIS/Remote Sensing software which are not readily available in the country.
- (iv) Under the UNFCCC system, Zimbabwe needs assistance in access special multi-lateral funding so that she can benefit from funding mechanisms such as Green Climate Fund, Adaptation Fund, REDD⁺ and so on.
- (v) Capacity development for human resources is key to Zimbabwe to enable her execute activities and programmes that contribute to climate change mitigation and adaptation. To speed up the development of National Climate Change Response Strategy Zimbabwe needs skills to enhance and guide this policy formulation processes. These processes require backing.

5.0 RECENT CLIMATE CHANGE ACTIVITIES AND PROJECTS RELATED TO FORESTS AND RANGELANDS

Zimbabwe has not done much on climate change adaptation and mitigation activities related to forests and rangelands. Most exiting programmes are of a pilot nature hoping to gain experience in preparation for bigger future projects. Some of the current and future efforts are as follows.

(a) Existing Projects

- National afforestation and reforestation programme
- Rehabilitation of degraded lands
- Woodland Management
- Tobacco Wood Energy Programme
- Schools Tree Growing and Tree Care Competitions
- REDD⁺ Ecosystem Conservation Programme
- Community Based Natural Resources Management
- Fire Management programme for forests and rangelands
- Eradication of Invasive Alien plants and diseases
- Coping with Drought Programme

(b) Planned Projects

- Full REDD+ Programmes
- Forest and Rangeland Resource inventories
- Wood Energy-serving Domestic Cooking Stoves Phase II
- Climate Change Adaptation and Mitigation
- Species screening and site matching
- Re-defining of silvicultural/ecological zones

6.0 FUNDING OPPORTUNITIES

(ii) Zimbabwe and FAO are in bilateral partnerships through a technical cooperation partnerships (TCP) for:

- Fire Management programme
- National Forest Programme
- Management of Invasive Alien forest pests and diseases
- Wildlife/Human Conflict

(ii) Zimbabwe and GIZ partnerships for

- National Vegetation Mapping projects (VegRIS)
- Wood Energy Serving Domestic Stoves (Phase I)

7.0 RECOMMENDATIONS AND CONCLUSION

Zimbabwe prioritizes climate change adaptation and mitigation as key components for addressing effects of climate change. Recommendations are that:

- Zimbabwe finalizes its national Climate Change Response Strategy which will guide forest related activities amongst others for the various economic sectors.
- Access to multilateral and bilateral funding sources is explored.
- Education and awareness on climate change be stepped up to win stakeholder buy in so that they appreciate and value the roles and benefits that can accrue to enhance sustainable development and environmental integrity.
- Forests and rangelands should be protected and conserved to ensure a safe habitat for the rich biodiversity there in. Uncontrolled fires should never be allowed in these ecosystems by developing effective fire management strategies and plans.
- Climate Change is complex and no one solution can solve its effects on forests, rangelands and other economic sectors in Zimbabwe. Forests and rangelands ecosystems are the most vulnerable to human activities and sound strategies and action plans need to be put in place so as to enhance the forest ecosystems' capacity as net carbon sinks.

In conclusion, for Zimbabwe to make meaningful progress in addressing climate change adaptation and mitigation:

- Capacity building support is paramount in the area of finance provision, knowledge, skills and technology transfer.
- Both bi-lateral and multilateral sources for assistance would go a long way in addressing some of the gaps, constraints and challenges being encountered in trying to address the effect of climate change.

Recommended Reading

1. Forest Act (Chapter 19.05, as amended 1999)
2. Communal Lands Produce Act (Chapter 20.04, 1987)
3. State of Forest Genetic Resources in Zimbabwe, Forestry Commission, Zimbabwe, 2011)
4. Parks and Wildlife Act (20.14)
5. Environment Management (Chapter 20.27)
6. National Environmental Policy (2003)
7. Zimbabwe Second National Communication to the United Nations Framework Convention on Climate Change (2012)
8. Zimbabwe Forestry Commission Internal Reports (Various)

THE END