

# **Climatic Change in Zambia: Ignore, Mitigate or Adapt?**

**Mweembe Muleya MUDENDA, Zambia**

*WE MUST ACT NOW OR HISTORY WIL JUDGE US- BRAZILIAN PRESIDENT LULA*

**Key words:** Climate change, Housing, Ecosystem, Millenium Development Goals

## **SUMMARY**

Through no fault of their own, it is the millions of poor and vulnerable people around the world whose lives and livelihoods are damaged by climate change. These people need climate justice. And as the world economy gradually picks up again from global crisis, Zambian economy will have daunting task of task of accelerating growth to 6-7per cent from existing levels of 5 percent in order to achieve the millennium development goals, deal with levels of poverty, insufficient economic diversification, attain the national vision of becoming a middle –income economy by the year 2030 among other target. Worse still, Zambia has started experiencing heavy rains at a time when the number of dwellers in unplanned settlements is increasing at a fast rate. Resilience of many ecosystems is *likely* to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g. flooding, drought, wildfire, insects) and other global change drivers (e.g. land-use change, pollution, fragmentation of natural resources and over exploitation of resources.

Should Zambia ignore, mitigate or adapt such impacts?

# Climatic Change in Zambia: Ignore, Mitigate or Adapt?

Mweembe Muleya MUDENDA, Zambia

## 1. INTRODUCTION

Sustainable development can reduce vulnerability to climate change, and climate change could impede nation's abilities achieve sustainable development.

Climate change in Intergovernmental Panel on Climate Change(IPCC) refers to change in the state of climate that can be identified( statistics test by the mean/and or variability of it properties that persists for a extended period, typically or longer. it refers to any change in climate over time, whether due to natural variability or as of human activity.

The United Nation Framework convention on climate change refers to a change of climate indirectly or directly as result of human activity that alters the composition of the global atmosphere and that in addition to natural climate variability observed for over comparable time periods.

Science tells us that climate change will bring about gradual changes, such as sea rise and shift of climate zones due increased temperatures and magnitude of extreme weather events such as droughts, floods and storms.

Some extreme weather event have changed in frequency and/or intensity over 50years. It is likely cold nights , cold days and frost before less frequent over most land areas, while hot days and hot nights have become more frequent. It is likely the frequency of heavy precipitation of rainfall will be more. Reduced yield in warmer regions due to heat stress and increased danger of wildfire. This will to increased demand water.



Figure 1: Zambia

The Zambian economy is predominantly based on exploitation of country's natural resources. The adverse effects of climate conditions are already felt. Already, agriculture, food security, housing and health thereby significantly affecting the economic, social and environment dimensions of our national sustainable development. Climate change is projected to reduce poor people's livelihood assets, for example, health, access to water, homes, and infrastructure. The UNITED NATIONS' Intergovernmental Panel on Climate Change (UN/IPCC) warned two years ago that droughts and floods would bring about adjustments to agriculture around the world(IPCC 2001)

At that time the predication was mainly on how climate change would affect agriculture, but in the case of Zambia, this year's floods have not only washed away crop fields but damaged infrastructure as well. Droughts, floods and the occurrences of diseases have become a major challenge in today's world. Gone are the days when winter was winter and summer was summer. It is just a different world with weird weather conditions. Like other southern African countries, Zambia has in recent times been affected by droughts and floods. Between December 2006 and March 2007, Zambia was among other southern African countries that experienced massive flooding. The flooding, which left hundreds dead in the region and around 1.25 million homeless, was said to be the worst in living memory. Rivers across the region burst their banks as Cyclone Eline swept through, bringing new rains to lands already waterlogged(Times of Zambia,2008). In Zambia, houses, especially in the Copperbelt, Western and Lusaka areas were knocked down. People were forced to move to higher lands for safety. Hi-tech hydro dams were affected and millions of dollars *was likely* were spent in relief efforts. Yet again, the Meteorological Department predicted that *Zambia* to experience floods this rain season.

## 2. CAUSES OF CLIMATE CHANGE

### Human Settlements

*The mud house has been roofed with fine thatch by some of the province's finest thatch artists. The man has every reason to be proud of his new house but the joy may be short-lived as the rain season has set in. If the province experiences the floods that left hundreds homeless in the last rain season, his treasured home may not be standing there the next winter. It may be washed away by flash floods. Every year poorly-constructed houses fall from rains, but the number of affected households has increased during the 2006/2007 rainy season. Elsewhere, the settlement resembled even more closely a desolate refugee camp, with shelters fabricated from thatch and reeds and draped with dirty clothes and blankets. Remnants of sweet potato tubers were scattered on the ground. An area where homes used to be was now a muddy wasteland save for a single door, standing like the freak survivor of a shockwave that vaporised everything else(Times of Zambia)*

The tragic aspect of this spectrum is that the house is at the mercy of weather conditions that have grown more unpredictable in recent memory. Times and seasons have changed. Things

are not what they used to be and what they ought to be, at least in recent times. The weather patterns have become so inconsistent with looming floods almost every rain season. Increasing temperatures, heating up of formally cold spots on the planet poses a challenge to the way people live now. In short, times and seasons have taken a sudden shift and this is definitely changing the way people live.

Poverty is most prevalent in rural where infrastructure is either inadequate or inavailable. Muchima(2006) argues that the mushrooming of informal settlements in major towns in Zambia is as result of not failed housing policy but also migration of people rural area into the city. When these people cannot afford decent shelter, they create shelter for themselves with their initiatives and with their resources.

Housing Finance Institutions(*HFI*) traditionally provide banking services and mortgage lending. In Zambia HFIs have tended to take two major forms, namely, building societies and employer-sponsored housing loan schemes. However, the unsatisfactory overall performance and financial condition of the building society industry has limited the contribution of the housing finance institutions in the economy. The major constraints have been the unstable macroeconomic environment and the outdated Building Societies Act (BSA) of 1968, which has not been revised in line with the changing financial environment (FSDP, 2004)

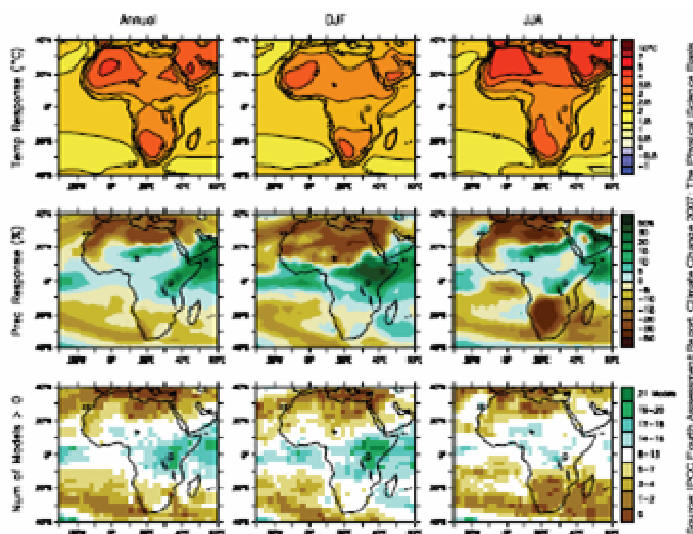
Further more, accelerated economic and infrastructural development will probably increase the risks of climate change in Zambia. Clearing forests for construction and increased industrializing will have negative consequences on Zambia's environment and atmosphere. Climate risks are definitely a challenge to development in Zambia. They are impacting negatively on our development. Zambia needs to mainstream climate risk reduction in its developmental process because the more developed you become, the more vulnerable you get.



**Figure: Zambia and floods**

Floods have a devastating impact on development. Without question, there is always a drawback to socio-economic development whenever they occur. For farmers, their crops are always washed away, posing another threat in the name of food security. Floods have always affected farmers in a whole lot of ways. It is so hard to yield anything if there are floods, there is need to devise a mechanism that will ensure food security. Natural disasters are natural disasters. In Zambia, the south is often dry, while the north is susceptible to droughts and floods on human health. There are diseases that are sensitive to climatic variability of climatic change. In this case diseases that are sensitive to rainfall, temperature, and these include malaria, diarrhea, dysentery and respiratory diseases.

## Ecosystem



*An example of global climate modelling. Such large-scale data is used in 'downscaling' to provide finer resolution projections that are often more suited to use at the local level.*

The degree of local environment will influence the vulnerability of an ecosystem to climate change. Degradation of forests in the Copperbelt through charcoal burning is major concern as people provide food for their families. With the current heavy rainfall, this is leading to soil erosion and drought.

Over the last two decades, the frequency of extreme climate events such as high surface temperatures, floods and droughts has increased over the entire globe. Although such extreme events are attributed to climate variability, they also signal that the earth is going through long-term climate changes in mean temperature.



Deforestation, urban sprawl, agriculture, and other human influences have substantially altered and fragmented our landscape. Such disturbance of the land can change the global atmospheric concentration of carbon dioxide, the principal heat-trapping gas, as well as affect local, regional, and global climate by changing the energy balance on Earth's surface.

Current efforts to combat global warming focus on reducing the emission of heat-trapping gases, but do not fully address the substantial contribution of land use to climate change. Since even small changes of 100 square kilometers in urban development or deforestation can change local rainfall patterns and trigger other climate disruptions, science and public policy must evolve to factor in all of the components of human-induced climate change.

Zambia is regarded as one of the highly forested countries whose forests cover about 60% of the total land area estimated at 64 million hectares most of which is administered traditional under customary law. The total area of indigenous forest in Zambia is 44.6 million hectares and covers 60 percent of the total land area, out of which 9.6 percent are gazetted forests. There are 481 Protected Forest Areas; 181 National Forests and 300 Local Forest Reserves in Zambia.

Greenhouse gas emissions occurred due to felling, slash and burn, fire and clearance for agriculture and deforestation effects. Carbon storage, above-ground biomass from forest is estimated at 1,821 M t while below-ground biomass equal to 492 M t. Current unsustainable levels of utilization have led to great losses of forest cover, which rose to as high as 850 000 ha/annum between the years 1990 to 2000. In total, between 1990 and 2005, Zambia lost 13.6% of its forest cover, or around 6,672,000 hectares. Annual deforestation rate for the



country is averaged at 445, 000 hectares per annum (1% total forest cover ).Standing forest carbon is estimated 50tC/ha. However, some studies also have estimated carbon at 910 Mt is in above ground biomass, 246 Mt in below ground biomass and 162 Mt Deforestation results in immediate release of the carbon stored in trees as CO<sub>2</sub> emissions(FAO Zambia,2009) It is estimated that deforestation contributed globally to approximately 20 per cent of annual greenhouse gas emissions in the 1990s in dead wood.

The increasing carbon fluxes into the atmosphere have drastically modified water and energy flows on the earth and people's livelihood (Houghton, 2002, 2003, 2005; IPCC, 2000, 2001). In D.R.C as well as in other African countries, there is a paucity of reliable field measurements of C stocks and fluxes from different ecological systems and their global climate related feedbacks. The massive tropical forest in D.R.C., strategically located around the equator, is a key element in local, regional and global fluxes regulation. However, the country has undergone decades of instability and poor governance coupled with an exponential demographic pressure which could have triggered significant land use/ cover and livelihood change with regional and global climatic impacts.

### **Deforestation**

The main drivers of deforestation and forest degradation are fire, charcoal making, tree felling, mining activities and clearance for agriculture and other human disturbances Intergrated Land Use Assessment was carried between 200-2007. It was the first project in Zambia that conducted a comprehensive and spatially representative National Forest Assessment since the 1960s. It provided generic estimates on biomass and carbon stocks of forests(FAO 2009)

Throughout Zambia, degrading land resources and poor water management are serious impediments to the development of agriculture. Inappropriate farming practices result in soil erosion, a loss of soil organic matter and declining fertility and capacity to retain water. Once-fertile soils become compacted and crusted, causing valuable rainwater to run off rather than seep into the ground and carrying with it precious topsoil and nutrients. The results are unhealthy crops due to water and nutrient deficits and the build-up of weeds and diseases, poor and unreliable yields, and chronic water shortages due to lack of recharge of ground water.

### **Water**

Water scarcity is already a major problem for the world's poor. The number of people impacted by water scarcity is projected to increase from about 1.7 billion people today to around 5 billion people by 2025, independent of climate change (IPCC 2001b). Climate change is projected to further reduce water availability in many water scarce regions, particularly in the subtropics, due to increased evaporation and changes rainfall. Close to two million more Africans are expected to find themselves without adequate clean water as early as next year. It said that will likely lead to an increase in poverty and pandemics such as malaria and cholera as well as theof arid and semi-arid lands, which affects food production.

### 3. CLIMATE CHANGE: IGNORE, MITIGATE OR ADAPT?

Can Zambia ignore climate change? Ofcourse not! We must act or history will judge us. We need goals and objectives on climate change.

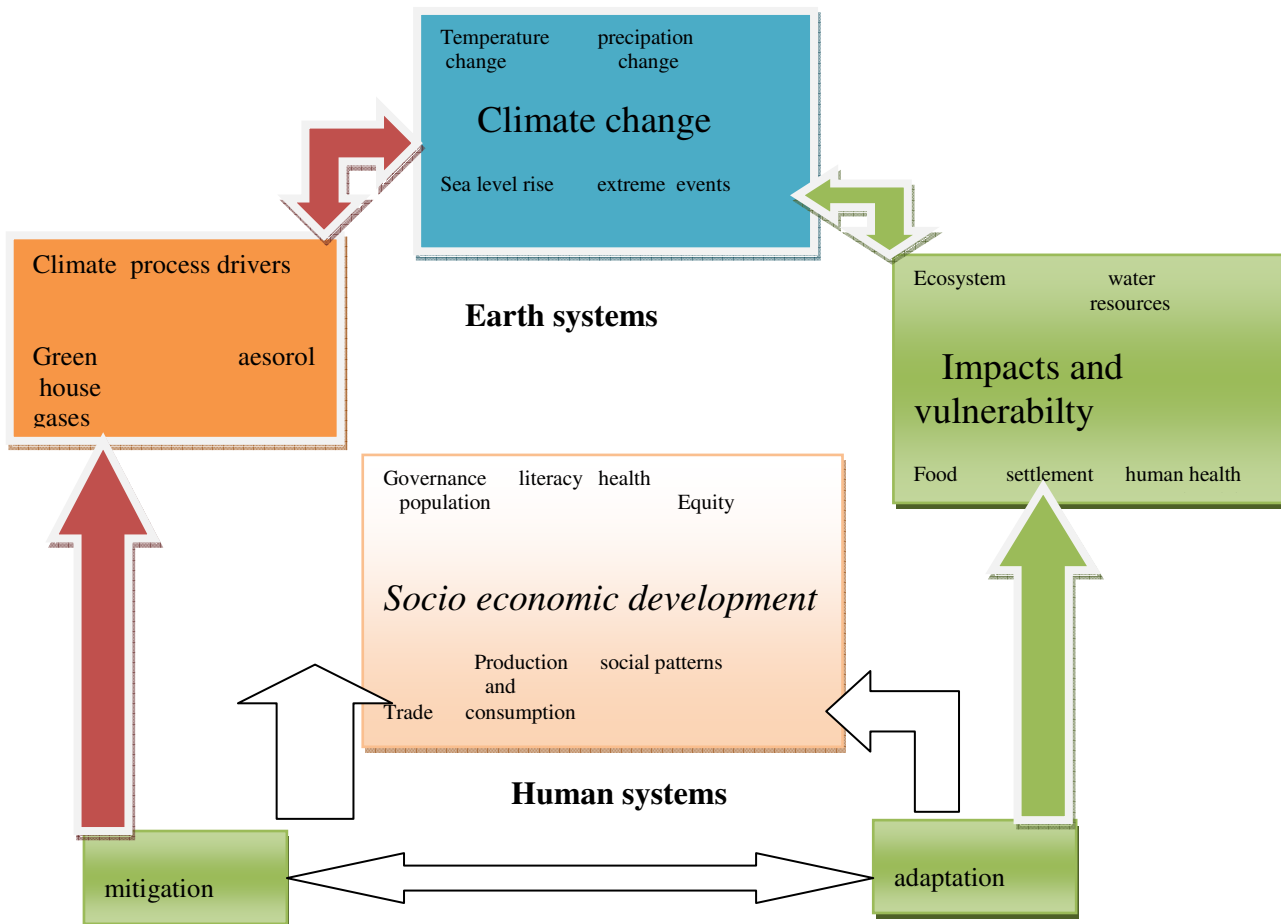


Figure 2: Schematic framework representing anthropogenic drivers, impacts of and responses to climate change and their linkages

### Mitigation



Mitigation, therefore, means taking actions before, during and after a disaster has happened in order to reduce the negative effects of disasters.

Understanding how climate change is increasing the vulnerability of the poor through its impact on their livelihoods, health, and economic opportunities is crucial to effective policy responses. Change policies related to energy efficiency and renewable energy are often economically beneficial, improve energy security and reduce local pollutant emissions. Reducing both loss of natural habitat and deforestation can have significant biodiversity, soil and water conservation benefits, and can be implemented in a socially and economically sustainable manner. Forestation and bioenergy plantations can restore degraded land, manage water runoff, retain soil carbon and benefit rural economies, but could compete with food production and may be negative for biodiversity, if not properly designed.

There is growing evidence that decisions about macro-economic policy, agricultural policy, multilateral development bank lending, insurance practices, electricity market reform, energy security and forest conservation, for example, which are often treated as being apart from climate policy, can significantly reduce emissions. Similarly, non-climate policies can affect adaptive capacity and vulnerability.

Examples of synergies include properly designed biomass production, formation of protected areas, land management, energy use in buildings, and forestry, but synergies are rather limited in other sectors. Potential trade-offs include increased GHG emissions due to increased consumption of energy related to adaptive responses.

Examples of regulatory tools include:

land-use planning: planning can do more to address such interrelated issues as land use, slum upgrading, improved water supply, sanitation and waste management

- water-basin management- technique which helps people to cope with the alteration between droughts and floods. As part of their new water saving approach, the farmers dig dams that are about four to five metres wide and three metres deep. In these dams they put a thin piece of plastic which will hold the water for longer periods. And to protect the water from evaporation during warm periods, the farmers cover the dams with grass, similar to the one they use to thatch their house
- Information on climate change
- Improved use of climate information will require strengthening existing institutions and processes to develop effective procedures for information collection and dissemination. This will include, and in turn contribute to, the development of trust and motivation among end-users. As well as the need to ensure that climatic information is focused on the needs of the poor, there are two kinds of challenges: the first involves situations where information exists, but is poorly coordinated and often not used, and the second involves situations in which relevant information is lacking. Generally, vulnerability assessments for current climate variability are more widely

available, while assessments for future climate variability are much fewer – although growing in number.

In many cases, these regulatory interventions exist but have limited impact and do not pay adequate attention to the communities that may be adversely impacted. It is therefore important that vulnerability assessments and climate-related codes and standards are integrated into the design and maintenance of infrastructure.

### **Adapting to climate change in Zambia**

Adaptation is key in context, defined as adjustment to natural or human system in response to experience or future variability and extreme events which may be beneficial or adverse (NAPA 2008).

- Water harvesting
- In order to take advantage of the logging flood water in Southern Zambia, some farmers are now digging holes and furrows around their settlements and directing them to their gardens. They are using a similar technique as the one used in large sugar and rice plantations which makes it possible to capture excess water so it can be used later. Those with roofed houses are now putting collection pipes on the edges of their roofs and then diverting the rain water into their small gardens or to drinking dams for their livestock
- Tree planting-
- UN's climate change fund has done little so far to help poor countries, leaving some African nations like Zambia to come up with their own home-grown solutions, like planting more trees.
  
- Government through the Disaster management unit in collaboration FAO Emergency, is helping disaster hit prone areas.

## **4. CROSS CUTTING ISSUES.. ZAMBIA AND THE MDG 7**

MDG7: Ensure environmental sustainability

The target on including environmental principles into Zambia's policies and programs and reversing the loss of its environmental resources is the only unlikely goal to be achieved. However, the possibility that Zambia will reach the target of improved water and sanitation services seem potentially achievable. However that of reducing slum dwellers by 2020 seems impossible.

Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.

Will target be met: \*UNLIKELY\*

Supportive environment: \*GOOD/FAIR\*

Target 10: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation.

Will target be met: \*POTENTIALLY\*

Supportive environment: \*GOOD/FAIR\*

Target 11: Achieve significant improvement in the lives of at least 1000 million slum dwellers by 2020

Will target be met: \*UNLIKELY\*

Supportive environment: \*GOOD/FAIR\*

By signing the Millennium Declaration, Zambia committed herself to halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day and the proportion of people who suffer from hunger.

## 5. CONCLUDING THOUGHTS

Zambia is not comfortable with the US\$30 billion United Nations climate change allocation for 2010 to 2013 which, among other things, is supposed to be used to reduce green house emissions. Although COP15 was not a complete success, it was not a failure in that we managed to mobilise the world to start thinking about climate change as a global challenge (Times of Zambia, 2009).

When all is said and done, what would Zambia accomplish by going to Copenhagen? Boer(2009) states that four essentials of COP15 are the following:

- How much are the industrialized countries willing to reduce their emissions of greenhouse gases?
- How much are major developing countries such as China and India willing to do to limit the growth of their emissions? Asian giants such as India and China are joining the United States and other industrialized countries as major producers of greenhouse gases.
- How is the help needed by developing countries to engage in reducing their emissions and adapting to the impacts of climate change going to be financed?
- How is that money going to be managed?

Zambia's future may lie in its ability to persuade developed countries to take more responsibility. We shall remain in pollution mess as long as industrialized countries don't take any action regarding their emission.

## **ACTION PLAN FOR ZAMBIA ADOPTED FROM EUROPEAN UNION**

- **Raising the policy profile of climate change.** Measures include: putting climate change on the agenda of high-level consultations under EU development cooperation agreements; preparing country- or region-specific briefs on climate change; promoting exchange programmes between the EU and partner countries to foster mutual understanding.
- **Support for adaptation and Capacity building.** Measures include: supporting partner countries in preparing vulnerability and adaptation assessments and national adaptation programmes of action (NAPAs) for least developed countries; developing guidelines for integrating climate change into development programmes – including measures to avoid maladaptation – based on consultation with all stakeholders; supporting capacity-building in developing country institutions to prepare for and reduce the impact of climate change-related disasters.
- **Support for mitigation and low greenhouse gas (GHG) development paths.** Measures include: supporting pilot projects to strengthen the links between government ministries and the research community; supporting partner countries to carry out research on low-carbon technologies and further develop local mitigation technologies; supporting capacity-building for developing countries' participation in the Kyoto Protocol's Clean Development Mechanism (CDM).
- **Capacity development.** Measures include: building individual and institutional capacity in impact prediction and vulnerability assessment; identifying ways to support improved coordination between developing countries to prepare for climate change negotiations; establishing knowledge banks to disseminate information and provide training for action on climate change.
- **Monitoring and evaluation of the Action Plan.** Measures include: regular discussions on implementation of the Plan and encouragement of feedback from stakeholders; preparation of a biannual evaluation report and, based on this, modification and updating of the Plan.

## REFERENCES

European union against climate change: working with developing countries to tackle climate change

UN-HABITAT(2008)GLTN: Grassroot participation of the land tool development, Kenya

IPCC (2007) Climate synthesis report.

Government Republic of Zambia (2004-2009) Financial sector development plan for Zambia

Government Republic of Zambia (2009) National Adaptation Program of Action to Climate Change

Government Republic of Zambia(2002-2009) Poverty Reduction Strategy Paper,Zambia.

Harold Times(2009)Boer:The essential in COP15, Denmark

Food and Agriculture Organization (2009) Climate change in Nepal, Rome.

Food and Agriculture Organization (2008) Farmer field school and Land and water in Africa, Rome

Impacts on land use on climate change scientist: [www.ceepa.co.za/doc/policy note](http://www.ceepa.co.za/doc/policy%20note)

Poverty and climate change: reducing the vulnerability of the poor

Majaliwa G(2008)Land use and climatic change effects on livelihoods and sediments and carbon loading in Lake Tanyanika, Zambia.

Sande kabaghe(2008)Climate change and Zambia: farmers forced to change their livelihood, Zambia

Times of Zambia(2008): NGO assesses climate change in Zambia

.



## **BIBLIOGRAPHY NOTE**

*'I suffered a stroke in June 2008 and I never gave up'*

## **Work experience**

I worked for Food and Agriculture Organization –Zambia office as Assistant Programme Officer, *Land and water division*

Achievements

Best student in Land Economy 2007, Copperbelt University

Best Researcher for Land Economy Thesis, Copperbelt University

## **CONTACTS**

Mweembe muleya Mudenda

mweembemudenda@yahoo.co.uk

Mobile +260 975 250353/ +260 955 75 63 92