



**THE REPUBLIC OF UGANDA**

**FIFTH NATIONAL REPORT TO THE CONVENTION ON  
BIOLOGICAL DIVERSITY**

**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY  
MINISTRY OF WATER AND ENVIRONMENT**

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## FOREWORD

Uganda ratified the Convention on Biological Diversity (CBD) on 8<sup>th</sup> September 1993. Article 26 of the Convention requires Parties to the Convention, at intervals determined by the Conference of the Parties (COP), to prepare and present to COP reports on the measures which the country has taken in the implementation of the provisions of the Convention and their effectiveness in meeting the objectives of the Convention namely: the conservation of biological diversity, sustainable use of biodiversity and the fair and equitable sharing of the benefits arising from the utilization of genetic resources. The National Environment Management Authority (NEMA) is National Focal Point for CBD and thus provides overall coordination in the implementation of CBD and preparation of reports under the Convention including National Reports.

To-date Uganda has prepared four National Reports as follows: The first national report in January 1998, the second national report in May 2001; the third national report in January 2006 and the fourth national report in May 2009. These reports can be viewed at <http://www.cbd.int/reports> and [www.chm.nemaug.org](http://www.chm.nemaug.org). The focus of national reporting is to assess implementation of the CBD at the national level to provide information on outcomes that the COP is able to use to assess the status of implementation of the CBD, identify issues that need to be addressed, and provide appropriate guidance to countries and relevant organizations to enhance national implementation.

The preparation of the 5<sup>th</sup> National Report has been completed and it involved wide stakeholder consultations comprising of Government ministries, departments and agencies; academia and research institutions, Indigenous and Local Communities, Civil Society Organizations, Non Governmental Organizations, the private sector and the media. The report highlights some of the key achievements, outcomes, new and emerging issues since the fourth national report that was prepared in May 2009. Key challenges, lessons learnt and opportunity to address the challenges are also highlighted in the report.

Preparation of this report was informed by technical reports prepared by Thematic Working Groups during the stock-taking of baseline information for the review and updating of the National Biodiversity Strategy and Action (NBSAP) for Uganda. The reports were categorized into the following:

- a) Biodiversity status, trends, and threats and implications for human wellbeing;
- b) NBSAP implementation and the mainstreaming of biodiversity;
- c) Progress towards the 2015 and 2020 Aichi Targets and contributions to the relevant 2015 Targets of the Millennium Development Goals; and
- d) Status of biotechnology and biosafety in Uganda.

The above reports will be produced and disseminated as technical series (the first of its kind in Uganda) to inform and create awareness among decision makers and public on the importance of biodiversity.

I thank the Global Environment Facility (GEF) for providing the funds which made it possible for Government of Uganda to prepare the Fifth National Report. I further extend appreciation to the United Nations Environment Programme (UNEP) for assisting Uganda to access the funds from GEF and for the technical assistance rendered during the preparation of the report.

Unlike previous National Reports that were prepared by consultants, the Fifth National Report was prepared by a Working Group comprised of experts that were part of the Thematic Working Group that carried out the stock-taking for the review and updating of the NBSAP for Uganda. The CBD National Focal Point coordinated and provided guidance during the whole process.

The Working Group that prepared the Fifth National Report did not have to carry out a separate activity for obtaining baseline information/data because this was already generated by the Thematic Working Group for the review and updating of the NBSAP. The task of the Working Group was thus to analyse and package the information already available in the various sections of the Fifth National Report. Quality assurance was the responsibility of the CBD National Focal Point. This approach was very successful.

Lastly Government of Uganda remains committed to promoting the conservation and sustainable use of Uganda's rich biodiversity for sustainable national development, green growth and wealth creation for livelihood improvement and protection of ecosystems and ecosystem services for the present and future generations.



Dr. Tom .O. Okurut  
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## **ACKNOWLEDGEMENT**

The National Environment Management Authority (NEMA) coordinated the preparation of the Fifth National Report on behalf of Government of Uganda. Financial support for this activity was from the Global Environment Facility (GEF) through United Nations Environment Programme (UNEP). Additional financial support was from the International Institute for Environment and Development (IIED) that specifically focused on mainstreaming biodiversity into development planning. NEMA, on behalf of Government, is grateful to GEF, UNEP and IIED for the financial support.

Uganda benefited from the capacity building workshops that was carried out by the Secretariat of the Convention on Biological Diversity (SCBD) to provide knowledge on how to prepare the Fifth National Report. The knowledge acquired from those workshops was used by the CBD National Focal Point Mr. Sabino Francis Ogwal to guide the preparation of the Fifth National Report by a Working Group (Annex 1). The Secretariat of the CBD is commended for conducting the Capacity Building Workshop.

NEMA is grateful to the Working Group for preparing the Fifth National Report for Uganda on behalf of Government. The group worked tirelessly to deliver this report. The Working Group comprised of technical officers from Government ministries, departments and agencies as well as NGOs involved in biodiversity management. Members of the Working were drawn from the Thematic Working Group (Annex 3) that carried out stock-taking for the review and updating of the NBSAP for Uganda. The basis for this was to use the capacity that had been built for the review and updating of NBSAP and also to facilitate flow and sharing of information generated from the stock-taking.

NEMA extends appreciation to all stakeholders who contributed information and comments that were used by the Working Group to revise and refine this report. This made it possible for the report to capture useful information that would have been omitted in the report. The Technical Committee on Biodiversity Conservation (Annex 2) provided overall technical guidance during the preparation of the Fifth National Report. Their input was critical and helped the Working Group to address gaps. NEMA commends members of the Committee for their support and dedication.

The preparation of this report required effective coordination and guidance on the COP decisions for preparation of the Fifth National Report. This task was ably carried out by the CBD National Focal Point. He was assisted by Ms Monique Akullo and Junior Musinguzi who were NBSAP Project Officer and NBSAP Project Assistant respectively.

## ACRONYMS

<b>ABS</b>	Access to Genetic Resources and Benefit Sharing
<b>ACP</b>	African Caribbean Pacific
<b>BFP</b>	Budget Framework Paper
<b>BINP</b>	Bwindi Impenetrable National Park
<b>BMCT</b>	Bwindi Mgahinga Conservation Trust
<b>BOD</b>	Biological Oxygen Demand
<b>CBD</b>	Convention on Biological Diversity
<b>CCU</b>	Climate Change Unit
<b>CDM</b>	Clean Development Mechanism
<b>CEPA</b>	Communication Education and Public Awareness
<b>CITES</b>	Convention on International Trade on Endangered Species of Wild Fauna and Flora
<b>COD</b>	Biological Oxygen Demand
<b>CSWCT</b>	Chimpanzee Sanctuary and Wildlife Conservation Trust
<b>CTPH</b>	Conservation Through Public Health
<b>DFS</b>	District Forest Services
<b>DWRM</b>	Department of Water Resources Management
<b>ECOTRUST</b>	Environmental Conservation Trust
<b>EIA</b>	Environment Impact Assessment
<b>ENR</b>	Environment and Natural Resources
<b>EFR</b>	Environmental Fiscal Reform
<b>EPA</b>	Economic Partnership Agreements
<b>ERP</b>	Economic Recovery Program
<b>EU</b>	European Union
<b>FACE</b>	Forest Absorbing Carbon Emissions
<b>FIEFOC</b>	Farm Income Enhancement and Forest Conservation
<b>FSSD</b>	Forest Sector Support Department
<b>GDP</b>	Gross Domestic Product
<b>GEF</b>	Global Environment Facility
<b>GIS/RS</b>	Geographical Information Systems/Remote Systems
<b>GMOs</b>	Genetically Modified Organisms
<b>GTI</b>	Global Taxonomy Initiative
<b>HIPC</b>	Highly Indebted Poor Countries
<b>IAS</b>	Invasive Alien Species
<b>IDA</b>	International Development Assistance
<b>IDRC</b>	International Disease Research Collaboration
<b>IIED</b>	International Institute for Environment and Development
<b>IPA</b>	Innovations for Poverty Actions
<b>ITPGRFA</b>	International Treaty on Plant Genetic Resources for Food and Agriculture
<b>IUCN</b>	International Union for Conservation of Nature

<b>MAAIF</b>	Ministry of Agriculture, Animal Industry and Fisheries
<b>MDAs</b>	Ministries, Departments and Agencies
<b>MDGs</b>	Millennium Development Goals
<b>MFPEd</b>	Ministry of Finance, Planning and Economic Development
<b>MTEF</b>	Medium Term Expenditure Framework
<b>MTTI</b>	Ministry of Tourism, Trade and Industry
<b>MTWA</b>	Ministry of Tourism, Wildlife and Antiquities
<b>MWE</b>	Ministry of Water and Environment
<b>MWLE</b>	Ministry of Water Lands and Environment
<b>NAMAs</b>	Nationally Approved Mitigation Actions
<b>NAPA</b>	National Adaption Programme of Action
<b>NARO</b>	National Agricultural Research Organization
<b>NBI</b>	Nile Basin Initiative
<b>NBSAP</b>	National Biodiversity Strategy and Action Plan
<b>NDA</b>	National Drug Authority
<b>NCRI</b>	Natural Chemotherapeutic Research Institute
<b>NEA</b>	National Environment Act
<b>NEMA</b>	National Environment Management Authority
<b>NFA</b>	National Forestry Authority
<b>NPA</b>	National Planning Authority
<b>NTR</b>	Non Tax Revenue
<b>NWRA</b>	National Water Resources Assessment
<b>NWSC</b>	National Water and Sewerage Corporation
<b>ODA</b>	Overseas Development Assistance
<b>PEAP</b>	Poverty Eradication Action Plan
<b>PES</b>	Payment for Ecosystem Services
<b>POWPA</b>	Programme of Work on Protected Areas
<b>REDD+</b>	Reducing Emission from Deforestation and forest Degradation
<b>SAP</b>	Structural Adjustment Programs
<b>SPGS</b>	Sawlog Production Grant Scheme
<b>THF</b>	Tropical High Forest
<b>TN</b>	Total Nitrogen
<b>TP</b>	Total Phosphorus
<b>TSS</b>	Total Suspended Solids
<b>UNCST</b>	Uganda National Council for Science and Technology
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>USAID</b>	United States Agency for International Development
<b>UTB</b>	Uganda Tourism Board
<b>UWA</b>	Uganda Wildlife Authority
<b>UWEC</b>	Uganda Wildlife Education Centre
<b>WQMD</b>	Water Quality Management Department

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## EXECUTIVE SUMMARY

The report is divided into three Parts. Part I covers the status, trends, and threats to biodiversity and implications to human well-being. Part II deals with the National Biodiversity Strategy and Action Plan (NBSAP), its implementation, and the mainstreaming of biodiversity and part III presents progress towards the 2015 and 2020 Aichi Biodiversity Targets and contributions to the relevant 2015 Targets of the Millennium Development Goals (MDGs).

The executive summary highlights the most important findings and conclusions from the report to inform decision and policy makers, development partners, and all stakeholders involved in biodiversity conservation on the status of biodiversity in Uganda, the status of implementation, review and updating of NBSAP, progress in implementation of the national biodiversity targets and the Aichi targets. Throughout the report emphasis has been put on analysis, synthesis and where possible projections have been made to predict the likely future scenarios. Key outcomes that have taken place since the submission of the fourth national report are also highlighted in the report.

### Forests

In 1900 Uganda's forest cover stood at 50% of the total land cover equivalent to 12.1 million ha. This reduced to 4.9 million ha in 1990 and further down to 3.6 million ha in 2005. It is estimated that by 2012 the forest cover was 2.97 million ha. The annual decline in total forest cover was at an average of 89,000 ha per annum (1.8%) for the period 1990 to 2005, with the higher rate of 2.2% in private forests compared to 0.9% in the protected areas. This clearly shows that forest on private and communal lands are under serious threat. Further decline in forest cover is likely to continue in the coming years as the human population increases and people seek for more land to grow crops to raise income to improve their livelihoods. It is projected that if the current rate of 90,000ha/year on the remaining 2.96 million ha of forest is not reversed, Uganda may lose all its forests by 2040 which would have serious ecological and economic consequences.

It is envisaged that the total area covered by natural forests and woodlands will continue to reduce as a result of land use change to agriculture and grazing, indiscriminate cutting of trees for timber (for furniture and construction) and fuelwood (firewood and charcoal), which provide over 96% of energy for cooking in Uganda. As the forest cover is being lost, this could lead to energy crisis (biomass energy).

Deforestation and land degradation is estimated to cost 17% of the Gross Domestic Product (GDP). Land degradation is estimated to cost Uganda US\$ 625 million/year. It is projected that *per capita* forest area is to decline from 0.3 ha in 1991 to 0.1 ha by 2025 in the absence of any significant investments in forestry sector. As reported in the fourth national report, once the forests on private lands and communal lands have all been destroyed, the pressure will be shifted to central forest reserves and wildlife protected areas. Thus protection of forests outside protected areas is critical and was pointed out in the fourth national report,

Although the forest sector is facing challenges discussed above, there is opportunity to address the challenges both at the strategic and operational level. At the strategic level, His Excellency the President of the Republic of Uganda launched the National Vision 2040 on 18<sup>th</sup> April 2013. Vision 2040 is to be implemented through 5-year NDPs. The current NDP is now under review and this has provided the opportunity to strengthen Government investment in the ENR sector including forest management. The NDP has the four objectives for forest management:

- a) Restore forest cover from 3.6 million hectares (18%) to 4.9 million (1990 level WHICH IS 24%) hectares by 2015 with ultimate goal of achieving overall forest cover of 30%;
- b) Restore degraded natural forests in Forest Reserves and private forests;
- c) Reduce pressure on forest cover as a source of wood fuel and construction materials;
- d) Promote forestry based industries and trade.

### **Wetlands**

Wetlands contribute to poverty eradication by providing direct income opportunities to the rural poor. The findings in this report show extensive wetland encroachment which is reducing on the services and values that accrue from wetland resources. . In terms of ecosystems benefits from wetlands, approximately five million people in Uganda obtain free water from wetlands valued at US\$ 25million per year, making a saving of over US\$ 40 million in water scheme costs.

Up to late 1980s, wetlands were generally considered ‘wastelands’ to be reclaimed for agriculture in rural areas, and ‘drained’ as an anti-malarial measure in urban settings. By 1994, the need for conservation and sustainable use of wetlands was realized and this resulted in the formulation a national policy of wetlands. The wetland coverage on the surface area of Uganda was 15.6% in 1994 but has been declining. At the time the fourth national report was prepared, the wetland cover was estimated to be 29,000 sq. km, or 13% representing 2.6 % loss. Currently wetland cover is estimated to be 10.9% meaning 4.7% of the wetlands have been lost from the original 15.6% in 1994.

The pressures and threats to wetlands reported in the fourth national report namely unsustainable resource harvesting; habitat loss through agricultural conversion, industrial development and burning; and inadequate enforcement of legislation remain and is on increase especially conversion of wetlands to agriculture and settlements. In addition inadequate institutional mechanisms for managing wetlands and inadequate knowledge base on the ecology, hydrology and economic value of wetlands further compound the challenges of wetland management.

In the absence of investment and implementation of measures to address the threats to wetlands, the degradation highlighted above will increase with adverse ecological impacts that will affect national development and human wellbeing. However there are opportunities for addressing these challenges. The strategies adopted by Government include the following:

- a) The Vision 2040 has a national target of increasing the wetland coverage from the current 10.9% to 13% (29,000 km<sup>2</sup>) by 2040.

- b) A Wetland Strategic Plan has been developed to guide investment and management of wetlands. These are important entry points for tackling the threats to wetlands.
- c) Education and information dissemination to increase people's knowledge for increased wetlands wise use
- d) Restore hydrological and ecological functions in vital wetlands to improve availability, productivity, value and diversity of wetland products for use by local communities
- e) Development and implementation of management plans for key wetland areas to enable resource users optimize and fairly distribute wetland benefits
- f) Institutional capacity building at the districts and local levels for improved decentralized wetland management.
- g) Carryout applied research for improved wetlands management
- h) Adopt best user practices in wetlands management
- i) Strengthening the weak institutions and enforcement of wetland policies and laws

### **Fisheries**

Uganda's fisheries resources are diverse in both aquatic ecosystems and fish species biodiversity. The fish diversity in Uganda is dominated by cichlid family consisting of 324 species of which 292 are endemic to Lake Victoria. In addition, there are 42 non-cichlid species spread in the vast aquatic resources of Uganda. Of these, 15 are endemic to Lake Victoria. Fisheries resources are among the most significant natural endowments of Uganda. The Ugandan fisheries industry is largely artisanal, based on inland capture fisheries from lakes; Victoria, Kyoga, Albert Edward, George and Kazinga Channel, rivers, swamps and flood plains all of which are critical habitats, breeding and nursery grounds for fish covering about 18% (42 000 km<sup>2</sup>) of Uganda's total surface area. Overall, nearly 5.3 million people, including youth and women, are directly involved in fishing, fish processing and trading.

Over the last 20 years fish/fish products have emerged as the second largest group to coffee in agricultural exports of Uganda. Between 2002 and 2007, fish accounted for 18.8% of commodity export value, second to coffee (22.3%). Fish has in addition been the first non-traditional export commodity with exports overseas increasing from US \$ 5.3 m in 1991 to US\$ 119.6 million in 2010 with the highest quantity (36,614 tonnes) and value (US\$ 143,168 million) in 2005. Fish exports to Sudan, Kenya, DRC and Rwanda were valued at about US\$ 50 million in 2007 and US\$ 30 million in 2011. The gross value of fish at landing sites is estimated at US\$ 800 million.

By 2007, the fishery sub sector was the largest export earner for Uganda with the major export being fish fillet to the international market mainly the Europe, Middle East, United States, Egypt and South East Asia. Exports increased from 4,687 tonnes in 1991 to 31,681 tonnes in 2007. They peaked in 2005 when 39,201 tonnes were exported valued at US\$ 143 million. This trend was equally impressive in 2011 by registering a 7 percent gain that is US\$ 126 million in 2010 to US\$ 136 million in 2011. This makes the sector the second export revenue earner after coffee. However, the exported volume increased by a mere 1 percent that is 21.3MT in 2010 to 22.5MT in 2011 which is attributed to fishing sanctions imposed by the Government to regulate overfishing in that year. Increased fish trade has led to substantial capital investments directed

towards fisheries of the large lakes with 19 fish processing plants on the Ugandan parts of lakes Victoria and Albert.

However overall export to international markets have recently declined sharply, falling from a peak of 39,201 tons in 2005 to about 15,417 tons in 2010. This is mainly attributed to declining catches, falling stocks, over-fishing and expanses of regional markets. Further volume and value of fish exports have continued to decline since 2005 mainly as shown in the figure below due to reduction in catches resulting from unregulated fishing activities and expanses of regional markets that largely comprise trade in immature Nile perch. The decline in annual fish production is increasing fishing effort is exerting high fishing pressure on capture fisheries thereby causing fish scarcity and prompting use of destructive fishing gears and technologies. This has continuously led to increased investment and costs in fishing operations in an effort to catch scarce fish.

Thus although the fisheries sector is vital to Uganda's economy and people's livelihoods, it is facing a number of challenges. In addition to the threats pointed out the fourth national report, the fisheries resources sector is facing the following challenges: Open access fisheries management regime, declining fish stocks, increasing fishing effort, use of destructive fishing gears and methods, pollution and inadequate data on fisheries:

Government has proposed a wide range of intervention to address the above challenges and these include the following to promote sustainable use of the fisheries resources:

- a) Restock lake Victoria and Kyoga with native fish species to replenish the stocks
- b) Establish and maintain proper base data/information on fish stocks, fish species reproductive biology and their resilience potential.
- c) Strengthen fisheries co-management
- d) Promote and support aquaculture.
- e) Restrict entry into the fishery therefore limiting effort.
- f) Gazette a limited number of landings to reduce and concentrate landing sites to facilitate monitoring surveillance and control
- g) Establish no fishing zones especially fish breeding areas and protection them from destructive fishing
- h) Introduce closed fishing seasons
- i) Gear size control slot size control to be applied to all fish major fisheries but not rather to commercial fish species.
- j) Establish regional fisheries management institutions (like Lake Victoria Fisheries Organization on Lake Victoria) and harmonize policies and laws governing trans-boundary fisheries. The same should be done between Democratic Republic of Congo (DRC) and Uganda over Lakes Edward and Albert.

## **Pollution**

This was reported as one of the threats to freshwater ecosystem in the fourth national report. The Fifth National Report has concentrated on providing information on pollution at the Inner Murchison Bay. Inner Murchison Bay is 8 km east of the centre of Kampala, the capital city of Uganda.

The bay and its catchment covers an area of about 292 km<sup>2</sup> of which open water is 18 km<sup>2</sup> with average depth was 3.5 m. and wetlands area of 59 km<sup>2</sup>. Located north of Lake Victoria the bay is one of the 'hot spots' that has been receiving municipal/industrial wastewater, urban wastes and run-off from Kampala city for over 40 years now.

The Nakivubo, Kansanga, Kinawataka, Kirinya wetlands that used to function as filters/sinks to wastewater and flood stabilization has since been seriously encroached. The Inner Murchison bay is now the sink and source of pollution to the outer lake. Observed scenario include eutrophication, invasion by water hyacinth, fish kills, anaerobic conditions, smelly and unattractive conditions for investment. The lake water quality has extremely deteriorated over the years thus limiting its use for various needs. The deteriorating lake water quality now poses threat to public and ecosystem health and demands modifications in water treatment to more advanced water treatment methods which are very costly.

### **Status and trends of animal populations**

In general the population of large mammals is stable but also increasing for some of the taxa although there is observed decrease in population in some of the large mammals like buffalo. In the fourth national report, the population of buffalo was 30,308 and this reduced to 21,565 in 2010. This can be attributed to incidences of poaching. This trend triggered response from Government. Law enforcement has been strengthened to curb poaching in protected areas and the population of buffalos is beginning to increase again. By 2011, the population of buffalo was estimated at 21,639. The population of common eland has more than quadrupled from 309 in 2004/2006 to 1,409 in 2010.

There was no information given on the population of lions in the fourth national report, this has been provided in this report. There is observed decline in the population of lions which can be attributed among others to straying of lions outside protected areas into local communities which has resulted into incidences of poisoning. Government has come up with sport hunting programmes and this is encouraging local communities to protect wildlife that stray outside protected areas. This is beginning to yield positive results as the population of large mammals is increasing where sport hunting is being implemented. This intervention was piloted in ranches neighboring Lake Mburo National Park and is being expanded to other protected areas. This was not reported in the fourth national report.

### **Biodiversity for livelihoods and national development**

In addition to the importance of fisheries pointed out above, biodiversity is central to people's livelihood and national development because of the numerous tangible and intangible benefits provided by biodiversity namely provisioning, regulation, aesthetic/intrinsic and support functions. In the Vision 2040 Uganda aspires to transform from a peasant to a modern and prosperous country within 30 years. This transformation entails an overhaul in the operation of primary sectors of the economy such as agriculture, tourism, fisheries and environment of course.

There is a lot of untapped potential in Uganda's biodiversity that can be harnessed to spur economic development and transformation. Biodiversity conservation will therefore be an integral part of all development initiatives to ensure that benefits of national development culminate into socio economic transformation for prosperity across all segments of the population. Biodiversity is the basis of different sectors of the economy most notably agriculture, fisheries, forestry, wetlands, tourism, energy and health in addition to supporting the achievement of international development goals like MDGs and sustainable development goals.

Eco-tourism is gaining momentum in Uganda and Uganda's rich biodiversity is a major contributing factor. The number of tourist arrivals has been increasing over the year. The total number of annual tourist arrivals of 1,151,000 in 2011 representing 34 percent increase from 2010. Tourists visiting wildlife protected areas increased by 9.4 percent from 190,000 in 2010 to 208,000 in 2011. In 2012, the Tourism sector contributed US\$ 805 million accounting for 14.6% of total employment and 9.2% of GDP. In terms of GDP, the contribution of tourism increased from 7.6 percent in 2011 to 9.2 percent in 2012 thus registering a growth rate of 1.6 percent. It is now estimated that tourism contributes US\$ 1 billion annually to the economy. By 2011 tourism contributed 14.6 per cent of total employment (630,830 jobs) and the sector contributes 23 percent of the total registered businesses (hotels restaurants, recreational and personal services) in the country.

The tourism sector is project to become the mainstay of the economy contributing highest in foreign exchange earnings, tax and non-tax revenue, employment and to GDP as a whole. Government plans to make Uganda one of the top five tourist destination in Africa and among the top 10 long haul tourist destination in the world. Given that Uganda's tourism is mostly biodiversity based this is an important entry point for resource mobilization for the conservation and management of biodiversity.

In addition, agriculture depends on ecosystem services provided by biodiversity for pollination, water and nutrients. These components of biodiversity have enabled agriculture to play its development role in Uganda's economy over the years. The sector contributed 22.9 percent of total GDP in 2011 at current prices in addition to employing 65.6 percent of the total working population. Forestry contributes up to 6 percent of Uganda's GDP and employs about 100,000 people directly and another 750,000 indirectly. Equally, the sector provides wood fuel which meets the energy needs of over 90 percent of the population in addition to acting as a water catchment area thus playing an indirect role in the provision of hydroelectricity another source of energy.

### **Valuation of ecosystem services**

In Uganda, the annual contribution of ecosystem services is estimated to have decreased from US\$ 5,097 million in 2005 to US\$ 4,405 million in 2010. This decline has mainly been due to deforestation which has affected the resilience of the ecosystem and consequently the quality of goods and services accruing from the affected ecosystems.

Valuation studies of the protected areas have shown that the returns from ecosystems services overshadow stock harvesting The study was carried out in Murchison Falls Conservation Area

and Budongo Central Reserve protection areas and both PAs do not only conserve the biodiversity but annually contributes ecosystem services in:- non-timber products, mainly wood (US\$1.92 million), non-wood forest products (US\$ 2.17 million), medicinal and pharmaceutical (US\$ 0.88million), soil erosion control (US\$ 52.8million), carbon sequestration (US\$ 1.5 million), watershed protection and catchment services (US\$10.6 million), research and education (US\$0.02 million) and aesthetic (US\$ 56.92 millions).

The bequest and existence value of the ecosystem and the relocation and rehabilitation costs if the protection area were to be started in 2009 would have been above US\$ 14 and 46 billion respectively. The protected areas were also observed to be important sources of food, construction materials, firewood, water and religious and cultural services that although could not be directly allocated value, were critical in poverty reduction among the community living adjacent to the protected areas.

### **Climate Change**

The information on climate change in the Fourth National Report was generic and focused mainly on international level and less on the national circumstances. The Fifth National Report has attempted to address these gaps by providing more information on the linkages between climate change and biodiversity, case studies are also presented. Uganda's National Adaptation Programme of Action (NAPA) cites an average temperature increase of 0.28°C per decade in the country between 1960 and 2010, with the months of January and February most affected by this warming trend, averaging an increase of 0.37°C per decade. The frequency of hot days in the country has increased significantly, while the frequency of cold days has decreased.

Historical records of Uganda's glaciers show that the ice caps on the Rwenzori Mountains have shrunk significantly in the last 100 years. The percentage of ice loss is highest on Mount Baker (96%), followed by Mount Speke (91%), Mount Stanley has the lowest percentage of ice loss (68%), hence affecting biodiversity and ecosystems services. It's evident that the climate has changed and projected to continue to change if no actions are taken. Some of the key sectors which have been identified as being vulnerable to Climate Change impacts in Uganda that are important for ecosystem security are forestry, water, wildlife and agriculture.

The mean annual temperature is projected to increase from 1.0 to 3.1°C by the 2060s, and 1.4 to 4.9°C by the 2090s. Uganda being an agro-based economy, the increase in temperature will have adverse impacts on agricultural production which in turn will have impacts on livelihoods and revenue for government. Coffee is Uganda's most important cash crop. In the 1980s, the government estimated that farmers planted approximately 191,700 hectares of robusta coffee, most of which was grown in the low lands of south-eastern Uganda, and about 33,000 hectares of Arabica coffee in high-altitude areas of eastern and south-western Uganda. By 2012, the registered area under coffee growing was; 178,125 ha, 182,875 ha, and 187, 260 ha in 2009, 2010 and 2011 respectively.

A temperature increase of 2<sup>0</sup>C may have adverse impact on coffee growing areas. According to the survey undertaken by Oxfam Uganda in 2012, climate change will have an impact on the suitability of Arabica coffee growing areas in Uganda, including the Rwenzori Mountains. Most

areas will become less suitable, and particularly those at lower altitudes (1500m) will be severely affected. The annual export value for Arabica coffee in the year 2010/2011 was US\$161,676,750. If climate-induced yield losses occur in the order of 10–50%, these will affect Uganda's foreign exchange revenue potentially in the range of US\$15–80 million per year. The following measures have been taken to address impacts of climate change on biodiversity:

- a) Uganda is developed a National Climate Change Policy. Biodiversity and ecosystems' integrity and its importance to adaption and mitigation of climate change impacts have been highlighted in the policy.
- b) The NAPA has been piloted in three ecosystems comprising of semi-arid, lowland and mountainous ecosystems. The purpose was not only to strengthen communities' resilience to adverse impacts of climate change, but also to strengthen biodiversity and ecosystems' resilience to effectively adapt to climate change impacts.
- c) Ecosystem based Adaptation (EBA) projects are currently being implemented in Mt. Elgon and Mt. Rwenzori regions focusing on biodiversity and ecosystems' service through management, conservation and restoration.
- d) The national REDD+ strategy for Uganda has been finalised. Its main emphasis is on forestry conservation and restoration on both public and private lands.
- e) Climate change mainstreaming into sector policies, plans and programs is in progress, with key sectors like agriculture, forestry, energy, education, wetlands among others being encouraged to consider biodiversity conservation into their plans and policies.

### **Policies and institutional frameworks**

There are number of policies and laws on conservation and management of biodiversity and most of these have not changed much since the 4<sup>th</sup> National Report of 2009. The new policies since the Fourth National Report include:

- a) Draft Uganda Wildlife Policy 2013
- b) Uganda Wildlife Education Centre Bill 2013
- c) National Wildlife Research and Training Institute Bill 2013
- d) National Biotechnology and Biosafety Bill 2013
- e) National Land Use Policy 2011
- f) Plant Protection and Health Bill 2010
- g) National Oil and Gas Policy for Uganda 2008

At the time the 4<sup>th</sup> National Report was prepared, a study on governance of protected areas had just been commissioned by Government. The study was undertaken as part of analytical work to examine the progress towards the implementation of the Convention on Biological Diversity Programme of Work on Protected Areas (CBD POWPA).

The study concludes that Uganda has made considerable progress in putting in place the necessary institutional arrangements, legal and policy frameworks and conservation programmes which are consistent with the CBD obligations under article 8. Some of the milestones include local community participation in protected area management and revenue sharing with local communities. However, the issues of overlapping mandates, weak enforcement of laws, encroachment, poaching and illicit wildlife trade still pose a challenge. The findings of this study are informing country processes for improved governance of environment and natural resources.

### **Development of national biodiversity targets**

Development of national biodiversity targets was done by a Thematic Working Group comprising of key stakeholders from Government Ministries, Departments and Agencies, as well as academia, research institutions and representatives of CSOs. The national biodiversity targets developed by the Thematic Working Group were further refined by a national consultant and subjected to further review through a wider stakeholder's review workshop to validate the national targets. Each national biodiversity target has been assigned to a specific institution to take lead in the implementation and reporting on the progress towards achievement of the target. These institutions constitute **the biodiversity/target champions**. The setting of the national targets by the Thematic Working Group has created ownership of the national targets and this is expected to enhance implementation and reporting on the progress towards the achievement of the Aichi targets at the national level.

### **Progress of updating the NBSAP**

The process began in June 2012 with a capacity building workshop and is expected to end by or before end of December 2014. Financial support is from the GEF through the United Nations Environment Programme (UNEP). The first stakeholder review workshop was held in November 2013 to obtain input on the draft NBSAP2. The comments from the workshop are being addressed and thereafter a second stakeholder's review workshop will be held for final validation of NBSAP2. Specifically NBSAP2 will have the following additional features which are missing in the current NBSAP:

- a) New and emerging issues which have taken place since the first NBSAP was prepared in 2002. Among these are: climate change, oil and gas, taxonomy, green procurement and pollution.
- b) National biodiversity targets developed within the framework of the Aichi targets.
- c) The vision, goal and objectives have been aligned to the vision, mission and strategic goals of the Strategic Plan for Biodiversity 2011-2020) and also to long term national Vision 2040 and the National Development Plan.
- d) Based on (b) and (c) above, implementation of the strategic objectives of NBSAP2 will enhance reporting on Uganda's contribution in the implementation Strategic Plan for Biodiversity 2011-2020 and its Aichi targets as well as the national Vision 2040 and the National Development Plan.

### **How NBSAP2 differs from NBSAP1**

- 1) NBSAP2 has 7 strategic objectives while NBSAP1 had five. The two additional strategic objectives were identified by the Thematic Working Group. The additional strategic objective on resources mobilization will assist Government in reporting on resource mobilization for biodiversity financing in Uganda. Guidelines and Action Plans for Financing Biodiversity Conservation in Uganda have been developed to enhance resource mobilization. This is an outcome of a study on biodiversity financing in Uganda in line with Decision X/3 and XI/4.
- 2) NBSAP1 did not have national biodiversity targets. National targets have been developed for NBSAP2 for each of the 7 Strategic Objectives. In order to assess progress towards achievement of the national targets each target has strategies, activities and indicators. Specific national targets and strategies have been developed in NBSAP2 to address emerging threats to biodiversity which were not captured in NBSAP1 like climate change, oil and gas, green procurement among others.
- 3) To ensure that NBSAP2 promotes integration of biodiversity into the National Development Plan (NDP) and Vision 2040, the objectives and targets on ENR in the two planning documents have been mainstreamed into NBSAP2 so that implementation of NBSAP contributes to the achievement of the objectives and targets in the NDP and Vision 2040. In addition, revision of the NDP 2010/11 – 2014/15 is under way and issues on biodiversity is to be strengthened including support for implementation of NBSAP2 has been proposed to be included in the next NDP (2015/16 – 2018/19).

### **Key actions and outcomes since the fourth national report**

The major achievements that have taken place since the submission of the fourth national report include the following which were supported by the GEF:

- a) UNDP/GoU Project on the Conservation and Sustainable Use of the Threatened Savanna Woodland in the Kidepo Critical Landscape in North Eastern Uganda. Implementation of the project was officially launched on 11<sup>th</sup> December 2013. The objective of the project is to protect the biodiversity of the Kidepo Critical Landscape from existing and emerging threats. The expected outcomes of the project are two folds: (1) Strengthening management effectiveness of the Kidepo Critical Landscape PA systems and (2) Integrating PA Management in the Wider Landscape to reduce biodiversity loss outside protected areas. It is a four year project.
- b) Uganda received financial support from GEF through UNEP to pilot a Project on Testing the Effectiveness of Payment for Ecosystem Services (PES) through a randomized experimental design. Project implementation begun in June 2010 and will end in April 2014. The objective of the project is to testing effectiveness of PES for financing biodiversity conservation outside protected areas. The project has attracted interest from the private sector and discussion is on-going with the private sector to contribute financial resources to ensure sustainability of the PES scheme when the GEF support ends in April 2014

- c) A national Clearing House Mechanism (CHM) [www.chm.nemaug.org](http://www.chm.nemaug.org) was developed and launch on 13 December 2012, The launch and operationalization of the CHM website has been a huge milestone in promoting sharing of information on biodiversity nationally and globally. Framework for sharing information through the CHM was developed to guide stakeholder participation in sharing information through the CHM.
- d) A study on governance and valuation of protected areas was undertaken. The findings of the two studies have been used in addressing governance issue in ENR while the study on valuation of PAs has been used to illustrate the economic importance of PAs to national development and livelihood improvement.
- e) Guidelines for sustainable biofuel production has been developed and will be used to guide investors on how to comply with the regulatory requirements, especially the EIA and post EIA requirements for biofuel production in Uganda
- f) Guidelines for financing biodiversity conservation has been developed and will be used for resource mobilization for biodiversity conservation and for planning purposes by the Ministry of Finance, Planning and Economic Development and the relevant MDAs to allocation of resources to biodiversity conservation. The guidelines were an outcome of a study that was undertaken on biodiversity financing in Uganda in line with decision X/3.
- g) Cabinet approved the National Biotechnology and Biosafety Bill 2012. The Bill is now before parliament. Wider stakeholder consultation by Parliament on the Bill is on-going. When passed by Parliament, it will provide a legal framework to regulate biotechnology and use of GMOs in the country including on liability and redress that may arise through trans-boundary movement of GMO through Uganda.
- h) Study on taxonomy capacity needs assessment was undertaken. The study shown that personnel and infrastructure capacity on taxonomy is inadequate and proposed measure to address these and other challenges on taxonomy.
- i) A study on the role of indigenous knowledge in the conservation of medical plants was undertaken in line with Article 8j of the CBD. The study has made recommendations that are being used to strengthen participation of ILCs in biodiversity conservation in Uganda.
- j) Revision of national regulations on regulations has been initiated to align it to the Nagoya Protocol on ABS. Financial support is from the GEF through UNEP.
- k) A study on Building a Foundation for Sustainable Wildlife Trade in Uganda with a focus on the review of the National Wildlife Trade Policies in Support of the Convention on International Trade in Endangered Species of Wild fauna and flora (CITES) was undertaken. The findings of the study indicate that wildlife trade has a huge potential to generate foreign exchange for Uganda and wealth creation. The findings of the study were used to inform the review of the wildlife policy on matters concerning wildlife trade in Uganda.
- l) The Uganda Wildlife policy was revised in 2012 and has been aligned with other government policies that impact on wildlife, emerging issues such as oil and gas development while enhancing the contribution of the sector to national transformation.

- m) A study on the review of national wildlife trade policies in support of the Convention on International Trade in Endangered Species of wild fauna and flora (CITES) was carried out as part of enhancing synergies between biodiversity related Conventions. It was coordinated by the CBD National Focal Point on behalf of Government. The findings of this study was used to inform the review of the Uganda Wildlife Policy referred in (l) above.
- n) Cabinet approved the Uganda Wildlife Training and Research Institute Bill 2013 and Uganda Wildlife Education Centre Bill 2013. Both Bills will soon be tabled in Parliament. When passed the Bills will enable Uganda Wildlife Training and Research Institute to take lead in wildlife sector research programmes previously performed by the former Uganda Institute of Ecology. Similarly, Uganda Wildlife Education Centre Bill will scale up awareness programmes by facilitating conservation through education.
- o) Government, through Ministry of Tourism, Wildlife and Antiquities, commenced review of the Uganda National Wildlife Act, cap. 200 in 2013. The updating of this legislation is done hand in hand with domestication of CITES and the Lusaka Agreement that will ultimately stamp out illicit trafficking of wildlife and wildlife products, illegal trade and poaching.

### **Mainstreaming biodiversity**

Uganda has made significant progress in integrating biodiversity into National Development Plan and Vision 2040. Biodiversity is recognised in the NDP under ENR .ENR is one of the enabling sectors that provide a conducive environment for all other sectors to thrive like trade and tourism among others. In the NDP there is a specific objective on restoration of degraded ecosystems (wetlands, forests, water, rangelands). The strategies are to restore the forest cover by re-forestation and afforestation, involvement of the public in tree planting and to restore the wetlands, rangelands & monitor the restoration of the ecosystems by gazetting wetlands, monitor & inspect the restoration of ecosystems.

Projections indicate that Uganda will graduate into a lower middle income country by 2017, progressing to an up-per middle income category by 2032 and attaining its target of USD9500 in 2040. Projections further indicate that Uganda will be a first world country in the next fifty years. To achieve this transformation the average real GDP growth rate will have to be consistent at about 8.2 per cent per annum translating into total GDP of about US\$ 580.5bn with a projected population of 61.3 million in 2040. Among the aspiration for Vision 2040 - Ugandans desire a green economy and clean environment where the ecosystem is sustainably managed. The design and implementation of the Vision emphasizes sustainable development through preservation of natural resources such as forests and wetlands.

Over the Vision 2040 period efforts will be undertaken to attain a green and clean environment with no water and air pollution while conserving the flora and fauna and restoring and adding value to the ecosystems. Sustainable utilization of the ENR will be addressed in line with Uganda's commitment to the principles of the Rio Declaration on Environment and Development, the Programme for the Further Implementation of Agenda 21 and the Plan of Implementation of the World Summit on Sustainable Development (Johannesburg Declaration on Sustainable Development) among others. Uganda will take urgent measures to protect the

environment and natural resources and ensure their future sustainability. Implementation of NBSAP will contribute ensuring sustainable use of biodiversity and environmental sustainability

In addition the concept of the green economy will be considered in the context of sustainable development and poverty eradication as one of the important tools available for achieving sustainable utilization of the ENR sector in Uganda. The green economy will contribute to eradicating poverty as well as sustaining economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the ecosystems.

Efforts will be made to restore and add value to the ecosystems (wetlands, forests, range lands and catchments) by undertaking re-forestation and afforestation on public land, promoting participation of the population in tree planting on both private and public land and enhancing private investment in forestry through promotion of commercial tree planting on private land and adoption of green agriculture practices. This will lead to restoration of forest cover from the current 15 per cent of the total land area to 24 percent.

Restoration of degraded wet- lands, hill tops, rangelands and other fragile ecosystems will be achieved through the implementation of catchment –based systems, gazettement of vital wetlands for increased protection and use, and monitoring and inspecting restoration of ecosystems (wetlands, forests, catchments). Conservation and wise-use of ENR and cultural diversity for collective benefit of the present and future generations and adoption of patterns of production, consumption and reproduction that safeguards the environment will be undertaken as a matter of urgency.

### **Financing for biodiversity conservation**

Since the 2005/06 financial year, the budgetary allocation for biodiversity conservation related investments at the national level have increased. Investments in tourism and wildlife management, environment management and agriculture have increased from \$20 to \$27.7 million, \$65 to \$82 million and \$59 to \$139 million for tourism and wildlife, water and environment and agriculture respectively.

However a study on financing biodiversity conservation in Uganda indicates that stakeholders in biodiversity conservation have always reported a shortfall in resources. The financing gap for biodiversity conservation related investments in Uganda is estimated at \$455 million/year. The current financing is \$216 million while \$671 million is required. The largest financing gaps is in the agriculture sector at \$366 million/year, in line with the country's commitments under CAADP, while other gaps cover the other primary sub-sectors of environment and natural resources, and tourism, wildlife and antiquities as well as research.

## **Synergies with other MEAs in the implementation of NBSAP**

Implementation of the NBSAP is carried out in close collaboration with other MEAs such as UNFCCC, CITES, Ramsar, Biosafety, ITPGRFA among others. The outcome has been the following:

- a) Ownership of the NBSAP review and updating process. Outline of the revised and updated NBSAP and the road map were developed with participation of National Focal Points for the MEAs stated above.
- b) Provision of information including information on climate and climate change (adaptation and mitigation) was provided by the Climate Change Unit
- c) Integration of climate change in NBSAP2. Climate change was not specifically provided for in NBSAP1 although analysis of the NBSAP1 indicated implementation of NBSAP1 contributed to adaptation and mitigation of climate change.
- d) A study on the review of national wildlife trade policies in support of the Convention on International Trade in Endangered Species of wild fauna and flora (CITES) was carried out as part of enhancing synergies between biodiversity related Conventions.

## **Key lessons learnt from NBSAP implementation**

- a) An effective and well resources coordination unit is vital for implementation of NBSAP. Currently the coordination is by the CBD National Focal Point with no support staff.
- b)
- c) PES has the potential to reduce loss of biodiversity. However sustainability of PES schemes needs participation and financial support from the private sector and other beneficiaries of environmental service
- d) Primary data is needed to assess progress towards achievement of national biodiversity targets
- e) Awareness level on NBSAP1 was low. It was developed by consultants unlike for NBSAP2 which has had input from the Thematic Working Group that carried out the stocktaking of baseline information for the review and updating of NBSAP1. Members of the group were drawn from Government ministries, departments and agencies as well as from academia, NGOs and the private sector. This approach has already created awareness across the diverse composition of the Thematic Working Group.
- f) Inadequate financial resources limited implementation of NBSAP1

- g) Mainstreaming biodiversity in the relevant sectors including the National Development Plan is a very useful tool for leveraging/mobilizing financial resources
- h) Mechanism for sharing information on biodiversity is critical. It contributes to creating awareness biodiversity

### **Some success cases in the implementation of NBSAP1**

- a) CBD Programme of Work on Protected Areas (Governance and Economic Valuation of Protected Areas)  
Formulation of ABS regulations
- b) Preparation of a National Invasive Species Strategy and Action Plan
- c) Successful development, launch and operationalization of a National Clearing House Mechanism ([www.chm.nemaug.org](http://www.chm.nemaug.org)). A Framework for Sharing Information through the CHM was also develop to guide stakeholder participation and provision of biodiversity information for sharing through CHM website
- d) A study on biodiversity financing and development of Guidelines and Action Plans for Financing Biodiversity in Uganda
- e) A study on the Role of Indigenous Knowledge and Practices in the Conservation of Medicinal Plants
- f) A study on taxonomy capacity needs assessment for Uganda
- g) Development of Guidelines for Sustainable Biofuel Production in Uganda
- h) Valuation of the contribution of the forest sector to national economy
- i) Inclusion of biodiversity in the National Development Plan (2010-2015) especially at ecosystem level – wetlands, forests, rangelands
- j) Continuous engagement of Ministry of Finance in Mobilization of Resources for Financing Biodiversity. Some progress has been registered to this effect – Ministry of Finance has advised NEMA to include financial support for implementation of NBSAP in its budget allocation. Budget allocation to NEMA is expected to increase beginning FY2014/15

### **Key challenges in the NBSAP implementation**

- a) Balancing biodiversity conservation and oil exploration activities in the biodiversity rich areas in the Albertine Graben
- b) High rate of population growth is resulting into more demand for land for growing food and other cash crops. Fragile ecosystems such as wetlands, highly and mountainous areas are increasing being degraded resulting into flooding, siltation of water bodies and land slides
- c) Securing sustainable and predictable biodiversity financing
- d) Carrying out a comprehensive inventory of the biodiversity resources – including terrestrial, aquatic and below ground biodiversity.
- e) Creating adequate public awareness and education on biodiversity and sustainable use of biological resources;
- f) Managing biodiversity outside protected areas. Biodiversity loss in Uganda is greatest outside protected areas;

### **Opportunities for NBSAP implementation**

- a) Discovery of oil and gas in the Albertine Graben. Funds generated to be used to fund other sectors such as ENR
- b) Biodiversity has been included in Vision 2040 and in the NDP. This is an entry point for resources mobilization

### **Recommendations to enhance implementation of NBSAP**

- a) Support for strengthening institutional and human capacity for effective implementation of Aichi targets at the national level
- b) Mobilization of financial resources at the national level, from development partners and the GEF to support implementation of NBSAP2, the Aichi targets at the national level
- c) Engaging the private sector especially the oil companies to support biodiversity conservation and management
- d) Developing and implementing a communication, education and awareness strategy at all levels of society
- e) Restoration of degraded ecosystems that provide vital ecosystem services to the local communities and sustains national development programmes

### **Assessment of Progress towards the Aichi targets and the Millennium Development Goals**

Progress on the second part of 7A (reverse loss of environmental resources) is still slow. The National Development Plan (2010/11 – 2014/15) notes that forest cover in Uganda has been declining and NEMA (2011) reports an annual decline of 1.86% in the last decade. For instance total forest cover declined from 24% in 1990 to 18% in 2005. The forest cover further reduced to 15% in 2010 (Uganda Vision 2040). The loss mainly emanates from rapid conversion of forest land to other uses in response to a high population growth and reliance on fuel wood and charcoal for cooking energy (98% of the population). Government considers rural electrification as one of the strategies to reduce forestry loss and restore the 1990 level. The NDP mid-term review report however reveals that this strategy has been undermined by poor institutional coordination since forestry and rural electrification are mandates of totally different ministries. Nevertheless, Uganda is making progress in adopting renewable energy inform of energy efficient stoves and briquettes. The Government move to cut tax on solar equipment is also a step in the right direction.

Target 7B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss. Uganda's 2010 MDG progress report shows that there is still low progress on attaining the target of reducing biodiversity loss because of a number of constraints. The report highlights that poverty and a rapid population growth are the primary causes of biodiversity loss, threatening the existence of species, ecosystems and eco-regions throughout Uganda. A study carried out by NEMA in 2011 shows that the rate of biodiversity loss is accelerating and there clear indications that depletion of natural resources is still a big problem in Uganda. For instance, the share of land covered by forest declined from 25% in 1990 to 18% in 2006. Fish species are also

deteriorating at an alarming rate as evidenced by the fall in catches over the years. There is thus need for pragmatic intervention to reverse this falling trend.

### **Progress in implementing Aichi and national targets**

Implementation of the national biodiversity targets is linked to implementation of the Aichi targets since the national biodiversity targets were developed within the framework of the Aichi target as a flexible framework. The overall progress of implementation of the Aichi target is summarized in the table below in an Annex to this report.

National targets have been set within the framework of the Aichi targets. Progress has made in the national with significant progress in target 1,2,3,4,5,6,7,8,9,11,12,13,14, 15,16, 17, 18, 19 and 20. These have been as a result of concerted effort by stakeholders and also the fact that there are on-going activities and programmes that contribute to the realization of these targets. Case studies are provided in this report.

### **Progress in implementing the Strategic Plan for Biodiversity 2011-2020**

In decision X/2 paragraph 3(e) Parties to CBD were urged to monitor and review the implementation of their NBSAPs in accordance with the Strategic Plan for Biodiversity 2011-2020 and their national targets making use of the set of indicators developed for the Strategic Plan as a flexible framework and to report to the Conference of the Parties through their fifth and sixth national reports and any other means to be decided by the Conference of the Parties. Uganda has aligned its NBSAP2 to the five goals of Strategic Plan for Biodiversity 2011-2020 and also developed national biodiversity targets within the framework of the Aichi targets.

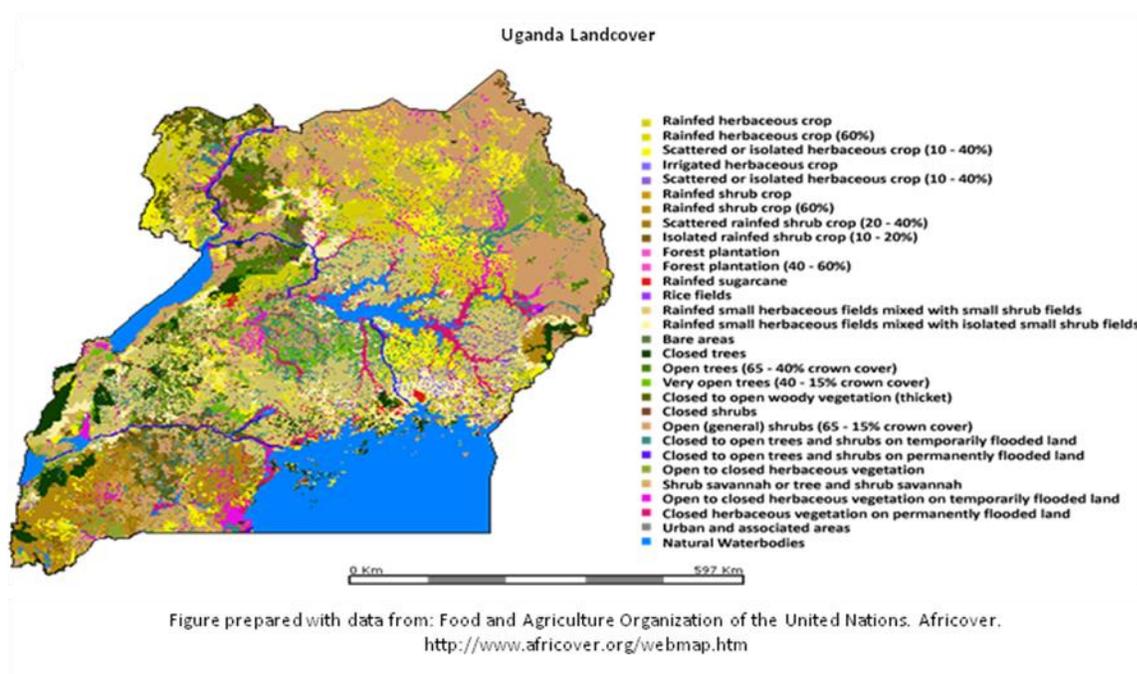
## PART I: STATUS, TRENDS, THREATS AND IMPLICATIONS OF BIODIVERSITY LOSS

### 1. INTRODUCTION

#### 1.1 Location, physical features, climate and demography of Uganda

Uganda covers an area of 241,038 square kilometers of which about a third is covered by fresh water bodies and wetlands. It is mainly a plateau astride the equator with favorable tropical climate and average temperature ranging from 18 to 28 degrees centigrade. It is endowed with numerous natural resources and these includes network of wildlife protected areas, forests, wetlands, lakes and rivers.

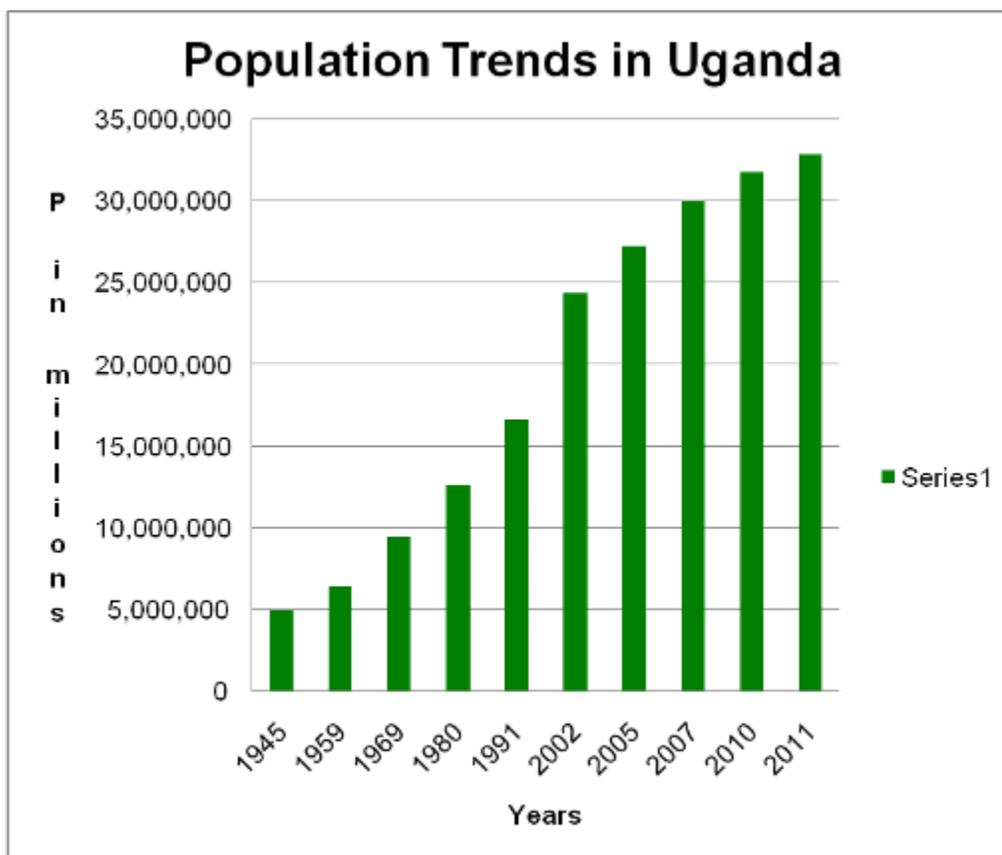
Figure 1: Map showing the different ecosystems in Uganda



Over the last three decades, the economy has moved from recovery to growth based on short-to-medium term planning and the country implemented a number of economic policies including the Structural Adjustment Programs (SAPs), Economic Recovery Program (ERP) and the Poverty Eradication Action Plan (PEAP). As a result the GDP growth has since 2002 been sustained at an average of 6.4 per cent. The macro-economy has remained relatively stable with inflation rates maintained at single digit level while public finance and monetary policies have been well managed

The population growth rate is 3.2% per annum and is among the highest in the world. In 1945 Uganda had a population of 5 million people. This rose to 6.5 million in 1959 and 9.5 million in 1969. By 1980 Uganda's human population was 12.6 million. In 1991 the population of Uganda was 16.7 million people. By 2002 the population had reached 24.4 million. In 2005 the population was estimated at 27.3 million and by 2007 the population was estimated at 30 million and in 2010 the population had reached 31.8 million. The population of Ugandans continues to rise. In 2011 the population was estimated to be 32.9 million. Currently it estimated to be 34 million people. About 51 per cent of these are female. Uganda has one of the youngest populations in the world with nearly half of them aged below 15 years due to a historically high and constant fertility rate of about 6.7 children per woman.

Figure 2: Uganda's population trend



From the figures and graph above, Uganda's population is doubling after every 2 two decades. More worrying is that only about 8% use electricity the rest (92%) depend on fuel wood for energy. Over 86% depend on agriculture. Use of biomass for energy and demand for more land for agriculture will only worsen deforestation and land degradation in the country leading to loss of vital ecosystems services (water, soil erosion control, pollination) that critical for food production and food security.

## **1.2 Ecosystem diversity**

Uganda is a country of exceptional biological diversity, encompassing a zone of overlap between the savannahs of East Africa and the West African rain forests. Designated by Sir Winston Churchill as the Pearl of Africa, Uganda is endowed with a vast array of landscapes of incredible aesthetic beauty. The geographic features of Uganda range from glacier-topped mountains, rain forests, savannahs and dry deciduous acacia bush-land to wetlands and open waters. These, along with a wide variation in climate and soils, combine to give the country an impressive range of terrestrial and aquatic ecosystems.

Natural forests and woodlands together cover an area of nearly 50,000 km<sup>2</sup> while wildlife protected areas cover approximately 11% of Uganda's land surface. Uganda has 10 National Parks, 12 Wildlife Reserves, 10 wildlife sanctuaries, 5 community wildlife areas, 506 central forest reserves, 191 local forest reserves and 12 Ramsar Sites.

Open water resources cover up to 17% of the country's surface area comprising of five major lakes; Victoria, Albert, Kyoga, Edward and George, about 160 minor lakes and an extensive river system. Wetland ecosystems constitute those areas with impeded drainage, swamp forests, papyrus and grass swamps. Wetland ecosystem coverage is estimated at approximately 10.9 % from 13 % (which was approximately 30,000 km<sup>2</sup>).

## **1.3 Species diversity**

The country's wide range of habitats supports a very high and rich diversity of both animal and plant species. With a recorded 18,783 species of fauna and flora, Uganda ranks among the top ten most bio diverse countries globally. But the total number of species could be much higher than this figure since a large number of species have not yet been recorded.

Uganda is host to 53.9% (400 individuals) of the World's remaining population of mountain gorillas, 11% (1057 species) of the world's recorded species of birds (50% of Africa's bird species richness), 7.8% (345 species) of the Global Mammal Diversity (39% of Africa's Mammal Richness), 19% (86 species) of Africa's amphibian species richness and 14% (142 species) of Africa's reptile species richness, 1,249 recorded species of butterflies and 600 species of fish.

Uganda harbours seven of Africa's 18 plant kingdoms – more than any other African country – and its biological diversity is one of the highest on the continent. It boasts of about 47% all African bird species, and is second only to the Democratic Republic of Congo in terms of number of mammal species. Details on the number of known genera and species in major taxonomic groups of Uganda's biota are available in the fourth national report and NBSAP (2002). These documents are available on the national Clearing House Mechanism for Uganda [www.chm.nemaug.org](http://www.chm.nemaug.org) and the CBD website [www.cbd.int](http://www.cbd.int).

## **1.4 Genetic diversity**

As reported in the fourth National Report, genetic characterization of populations in Uganda for both wild and domestic species is inadequate. Plant genetic resources (PGR) in Uganda range from little known indigenous wild fruits and vegetables, pastures and forages, medicinal plants,

indigenous staples like millet and sorghum to introduced crops such as maize, tobacco, coffee, cotton and beans. Details of species diversity are provided in the fourth national report.

One of the new challenges that have emerged since the fourth national report is oil exploration activities in the Albertine region, a biodiversity hot spot in the country. The Albertine region harbours more species of vertebrates than any other region on the African continent. This region also shelters more than half of continental Africa's bird species. There are more endemic mammals, birds and amphibians found in the Rift than any other site in continental Africa.

In order to ensure that oil and gas exploration activities do not have adverse impacts on biodiversity, Environment Impact Assessment is mandatory for all oil and gas exploration activities. A Strategic Environment Assessment (SEA) for the Albertine graben has been developed. An Environment Monitoring Plan and the Albertine Sensitivity Atlas (which covers biodiversity) have been developed and is already being implemented. Government is working closely with the oil companies to establish baseline which will form the basis for monitoring the status and trends of species and ecosystems when the oil refinery takes off (projected to start in 2018).

### **1.5 Policy, legal and institutional framework**

The institutions responsible for biodiversity conservation and management include the Ministry of Water and Environment, the Ministry of Tourism, Wildlife and Antiquities; the Ministry of Agriculture, Animal Industry and Fisheries; the National Environment Management Authority; the Uganda Wildlife Authority; the National Forestry Authority; and the Uganda National Council for Science and Technology. Recent developments in the institutional framework include the establishment of the Climate Change Unit (CCU) in 2009 and the restructuring of the former Ministry of Tourism, Trade and Industry (MTTI) into the Ministry of Tourism, Wildlife and Antiquities (MTWA) in 2011. The CCU was established to support a climate resilient and low Carbon development path for Uganda; and while MTWA is mandated to promote conservation of wildlife and associated ecotourism.

There are number of policies and laws on conservation and management of biodiversity and most of these have not changed much since the 4<sup>th</sup> National Report of 2009. The policies include the 1994 National Environment Management Policy; the 1995 National Policy for the Conservation and Management of Wetland Resources; the 1999 Uganda Wildlife Policy ; the 2002 Energy Policy for Uganda; the 2008 National Biotechnology and Biosafety Policy; the 2007 National Land Use Policy; and Oil and Gas Policy for Uganda, 2008. Some of these policies are under evaluation and /or review. These include the National Environment Management Policy and the Uganda Wildlife Policy. The new policies since the Fourth National Report include:

#### **Draft Uganda Wildlife Policy 2013**

This is a revised version and an update of the Uganda Wildlife Policy 1999. The review has made it possible to mainstream issues on oil and gas in the wildlife policy., human wildlife conflicts, illicit wildlife trade and trafficking, community participation in Protected Area conservation among others. The revised Policy is now before Cabinet for approval. The process to revise

Uganda Wildlife Act and formulation of regulations thereunder is also on-going to give effect to the revised Policy.

### **Uganda Wildlife Education Centre Bill 2013**

This Bill is before Parliament and seeks to transform Uganda Wildlife Education centre from a Trust Institution into a statutory body responsible for conservation education and awareness in Uganda.

### **National Wildlife Research and Training Institute Bill 2013**

The Bill is before Parliament. It seeks to transform and widen the mandate of the current Uganda Wildlife Training Institute into a National Wildlife Research Agency performing training and research functions of the defunct Institute of Ecology formerly in Queen Elizabeth National Park.

### **Biotechnology and Biosafety Bill, 2012**

A National Biosafety and Biotechnology Bill 2012 is now before Parliament and when passed will be a major milestone for regulating biotechnology and biosafety in Uganda. This is a follow up to the National Biotechnology and Biosafety Policy which was formulated in April 2008 and was report in the 4<sup>th</sup> National Report.

### **National Land Use Policy, 2011**

This Policy provides for sustainable land use management in Uganda. The Policy recognizes conservation in general as a form of land use and calls for sustainable management of Protected Areas of Uganda and biodiversity conservation in general.

### **Plant Protection and Health Bill, 2010**

The Bill now entitled the Plant Protection and Health Bill, 2010, is expected to introduce mechanisms for minimizing the risks of involuntary gene transfers and for managing the risks involved in biotechnology research and development. The current Bill is yet to be debated by Parliament.

### **National Oil and Gas Policy for Uganda, 2008**

Most of the oil and gas wells have been identified in sensitive ecosystems including wildlife protected areas. This policy clearly outlines Government intentions to exploit oil and gas for the benefit of Ugandans and commits Government to ensuring that oil and gas activities follow acceptable environmental standards. The policy identifies institutional responsibilities for monitoring of impacts to wildlife and clearly spells out roles of all stakeholders.

Biodiversity conservation and management function is executed through various Government Ministries, Departments and Agencies (MDAs) including: Ministry of Water and Environment, Ministry of Tourism, Wildlife and Antiquities; Ministry of Agriculture, Animal Industry and Fisheries; National Environment Management Authority, Uganda Wildlife Authority; National Forestry Authority; Uganda National Council for Science and Technology among others.

Institutions that have been established since fourth National Report include the Climate Change Unit established in 2009 to support a climate resilient, low Carbon development path in Uganda. Ministry of Tourism, Trade and Industry was re-structured into Ministry of Tourism, Wildlife and Antiquities in 2011 to promote conservation of wildlife and associated ecotourism.

## **1.6 Governance of Protected Areas**

Protected areas in Uganda include national parks, wildlife reserves, wildlife sanctuaries, community wildlife management areas, central forest reserves, local forest reserves, wetlands, lakeshores and riverbanks. Governance of protected areas is concerned with structures, processes and traditions that determine how power and responsibilities are exercised in a consistent and predictable manner. Good governance of protected areas requires the active participation of citizens in decision making.

At the time the 4<sup>th</sup> National Report was prepared, a study on governance of protected areas had just been commissioned by Government. The study was undertaken as part of analytical work to examine the progress towards the implementation of the Convention on Biological Diversity Programme of Work on Protected Areas (CBD POWPA).

The study concludes that Uganda has made considerable progress in putting in place the necessary institutional arrangements, legal and policy frameworks and conservation programmes which are consistent with the CBD obligations under article 8. Some of the milestones include local community participation in protected area management and revenue sharing with local communities. However, the issues of overlapping mandates, weak enforcement of laws, encroachment, poaching and illicit wildlife trade still pose a challenge. The findings of this study are informing country processes for improved governance of environment and natural resources.

## 2. STATUS, TRENDS AND THREATS TO BIODIVERSITY

### 2.1. Status of Ecosystems

#### 2.1.1 Coverage of protected areas

Uganda has a total of 735 forest and wildlife Protected areas comprising 10 National Parks, 12 Wildlife Reserves, 10 Wildlife Sanctuaries, 5 Community Wildlife Management Areas, 506 Central Forest Reserves and 192 Local Forest Reserves. This Protected Area Network covers 18% of Uganda' total land surface. Several wetlands are also protected and to date 12 Ramsar sites have been designated as wetlands of international importance and 34 Important Bird Areas (IBAs) that in most cases overlap the named protected areas.

The fourth national report indicated that protected area coverage was 16.3%. However it has been noted that Community Wildlife Reserves and Wildlife Sanctuaries were not included in that analysis. Thus a total of 735 forest and wildlife Protected Areas have been established covering 18% of the total area of 241,038 km<sup>2</sup> (Table 1). Therefore Uganda meets Aichi target 11 of the Strategic Plan for Biodiversity 2011-2020 which states that “ By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes”.

Table 1: Extent of Uganda's Protected Areas by category

Category of Protected Areas	No.	Area (km <sup>2</sup> )	%age of Uganda's Land area
National Parks	10	11,279	5.5
Wildlife Reserves	12	9,206	4.5
Wildlife Sanctuaries	13	714	0.3
Central Forest Reserves	506	10,796	5.3
Local Forest Reserves	192	50	0.02
Community Wildlife Reserves	05	4,783	2.3
<b>Total</b>	<b>735</b>	<b>36,828</b>	<b>18.0%</b>

Source: WPASP, 2002 and Forest Reserve Declaration Order, 1998, amended by UWA 2013)

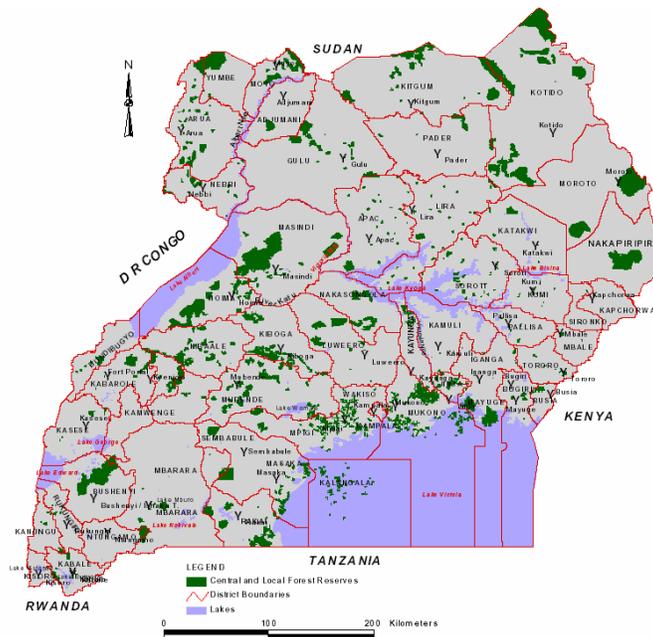


Figure 3. Forest Reserves in Uganda (NFA, 2005)

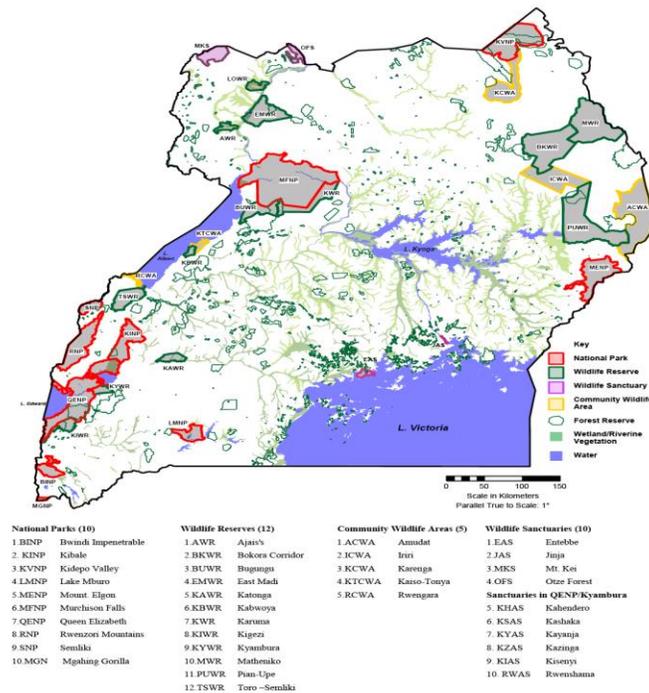


Figure 4: Wildlife Protected Areas (Source MTWA, 2012)

## IMPORTANT BIRD AREAS IN UGANDA

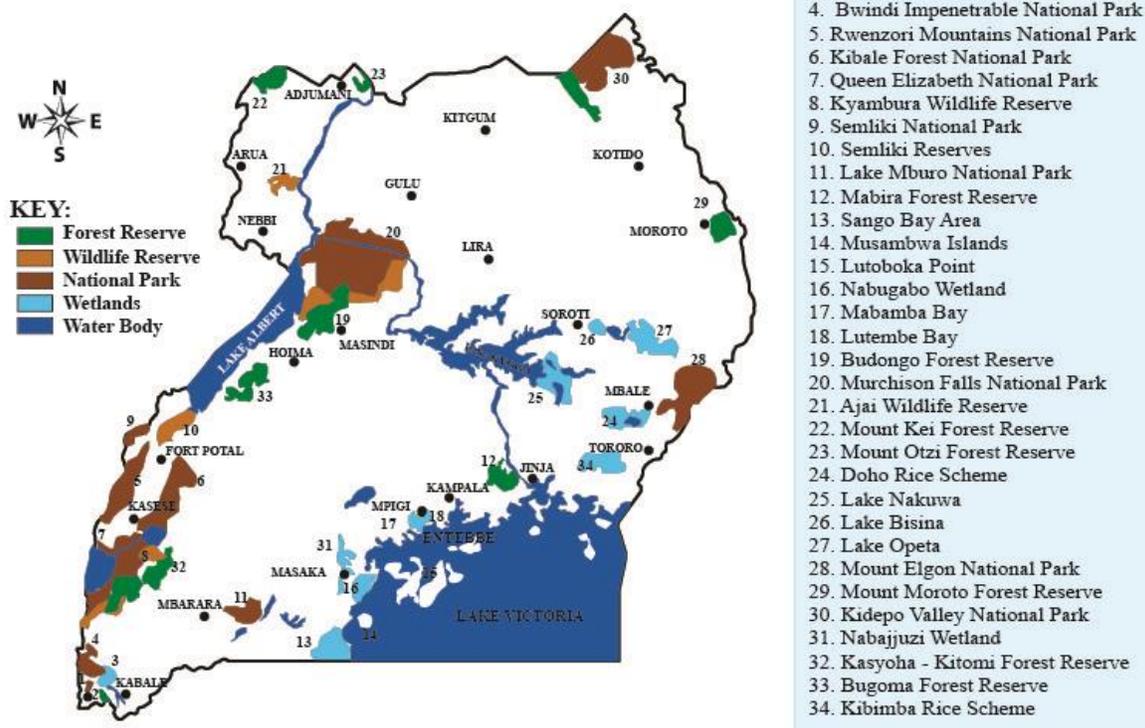


Figure 5: IBAs in Uganda, 2010 (Source: Nature Uganda)

The Wildlife Protected Areas coverage has remained unchanged in the last decade. However varying levels of threats have been experienced in the last five years with the problems of poaching, illicit wildlife trade and wildlife trafficking re-emerging. Occasional encroachment incursions have been experienced but these have been addressed on a case by case basis through strengthening enforcement.

The condition of Protected Areas from the baseline analyses of 2001 to 2008 indicate mean scores of  $2.08 \pm 0.24$  and  $20.8 \pm 0.14$  (Mean $\pm$ SEM, n=13) respectively. The 2009 and 2010 analyses show  $2.23 \pm 0.17$  and  $2.46 \pm 0.14$  (Mean $\pm$ SEM, n=13) indicating a general improvement in the status of Protected IBAs.

The condition of Forest Reserves registered declines through the years from baseline year 2001 to 2008 and 2009 with index scores of  $2.63 \pm 0.18$ ,  $2.25 \pm 0.25$  and  $2.11 \pm 0.2$  (Mean $\pm$ SEM, n=9) respectively. This has this time registered a reverse trend, meaning that some improvement is being realized with an index score of  $2.5 \pm 0.17$  (Mean $\pm$ SEM, n=10).

The slight improvement in 2009 seems to have been relative. This is because the status of the wetland IBAs have continued to decline through the years. The mean scores representing this are  $2.6 \pm 0.22$ ,  $2.13 \pm 0.23$  and  $2.3 \pm 0.26$  (Mean $\pm$ SEM, n=10) for 2001, 2008 and 2009 respectively while an index score of  $2.27 \pm 0.24$  (Mean $\pm$ SEM, n=11) for 2010.

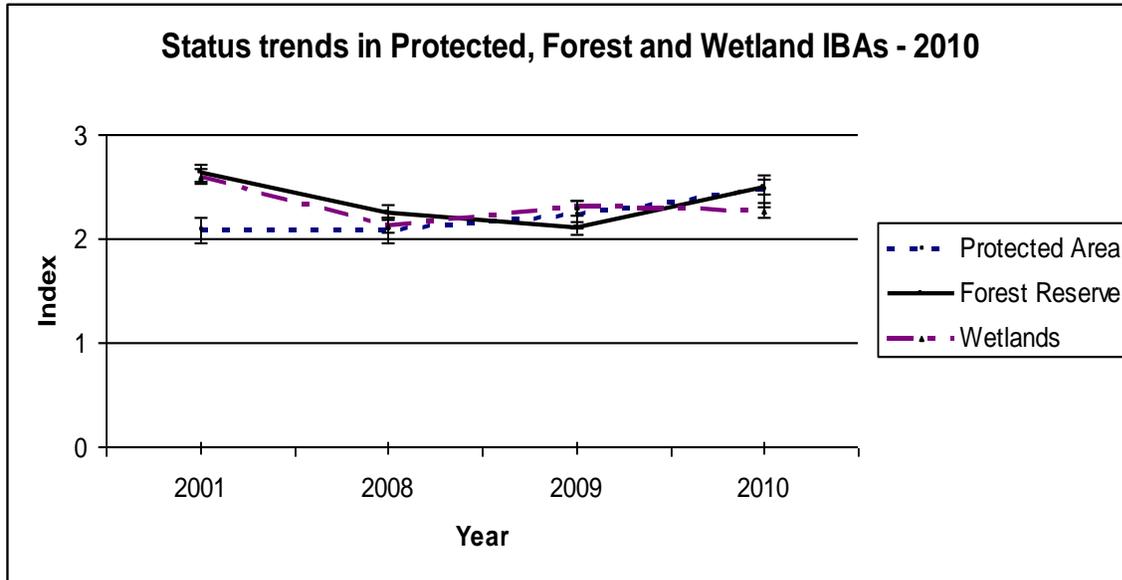


Figure 6: Status of wildlife protected areas, forests and wetlands. (*Nature Uganda*, 2010)

As shown in Figure 5 the 2001 baseline index for pressures in Protected Areas increased in 2008 and dropped in 2009 and increased again in 2010. The pressure index scores for the years are  $-0.92 \pm 0.24$ ,  $-1.15 \pm 0.19$ ,  $-0.85 \pm 0.22$  and  $-0.92 \pm 0.24$  (Mean $\pm$ SEM, n=13) respectively.

Pressure index score for Forest Reserves is below medium and showing steady decline from the previous scores. The 2008 – 2009 of  $-1 \pm 0.41$  decline to  $-0.89 \pm 0.26$  (Mean $\pm$ SEM, n=9) in 2009 and further decline of  $-0.7 \pm 0.26$  (Mean $\pm$ SEM, n=10) in 2010 is positive in conservation terms.

The only Pressure index score to have been recorded above “Medium” was in wetland IBAs. This shows continuous increase in pressures till 2008 and 2010 with a temporary halt in 2009. The index scores of  $-1.38 \pm 0.32$ ,  $-0.7 \pm 0.3$  (Mean $\pm$ SEM, n=10) and  $-1.27 \pm 0.36$  (Mean $\pm$ SEM, n=11) for 2008, 2009 and 2010 respectively.

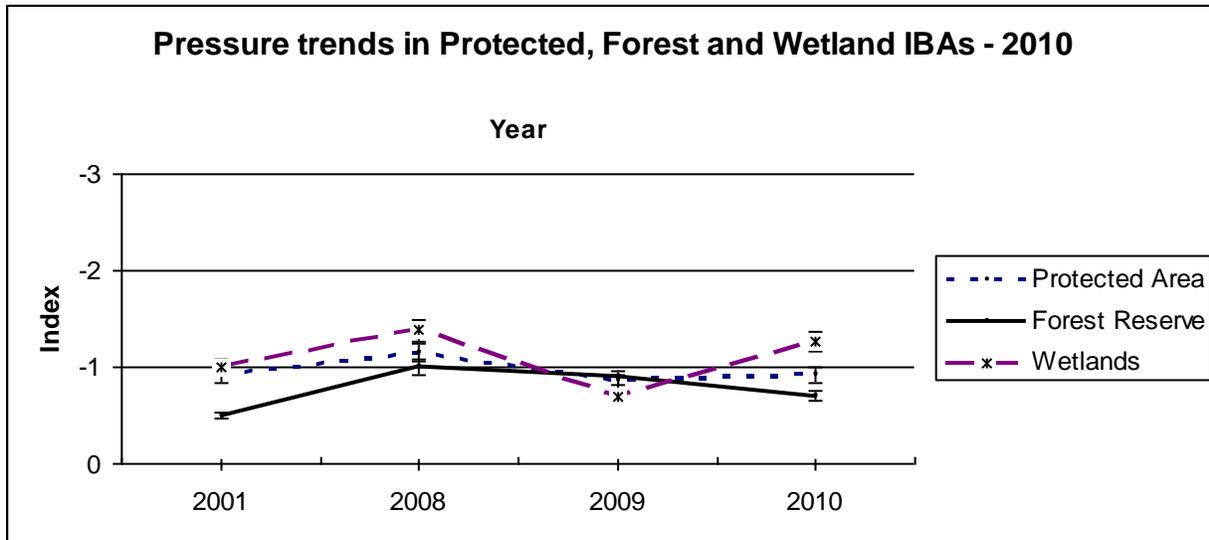


Figure 7: Pressure trends in wildlife protected areas, forests and wetland IBAs (*Nature*Uganda, 2010)

Conservation efforts in Protected Area have improved as shown in Figure 6. The index score has improved in 2010 with  $2.92 \pm 0.08$  having been slightly lower in both the previous two years with 2008 registering  $2.77 \pm 0.12$  and 2009 having  $2.62 \pm 0.14$  (Mean $\pm$ SEM, n=13) as in figure 20 below.

(iii) Conservation effort trends in Forest Reserves have however, continued to decline through the years 2008, 2009, and 2010 with index scores of  $2.5 \pm 0.5$ ,  $2.44 \pm 0.16$  (Mean $\pm$ SEM, n=9) and  $2.0 \pm 0.3$  (Mean $\pm$ SEM, n=10) respectively. It is worth noting that the overall index score for Forest Reserves have dropped to a rating of “Medium”.

(iv) Similarly, conservation effort trends in Wetland IBAs have continued to decline. It is the wetlands that are receiving less attention compared to the other forms of IBAs. The index scores for 2008, 2009, and 2010 show declining trends as  $1.63 \pm 0.32$ ,  $1.6 \pm 0.22$  (Mean $\pm$ SEM, n=10) and  $1.27 \pm 0.19$  (Mean $\pm$ SEM, n=11) respectively. The conservation actions for wetlands continue to drop and yet it is below average.

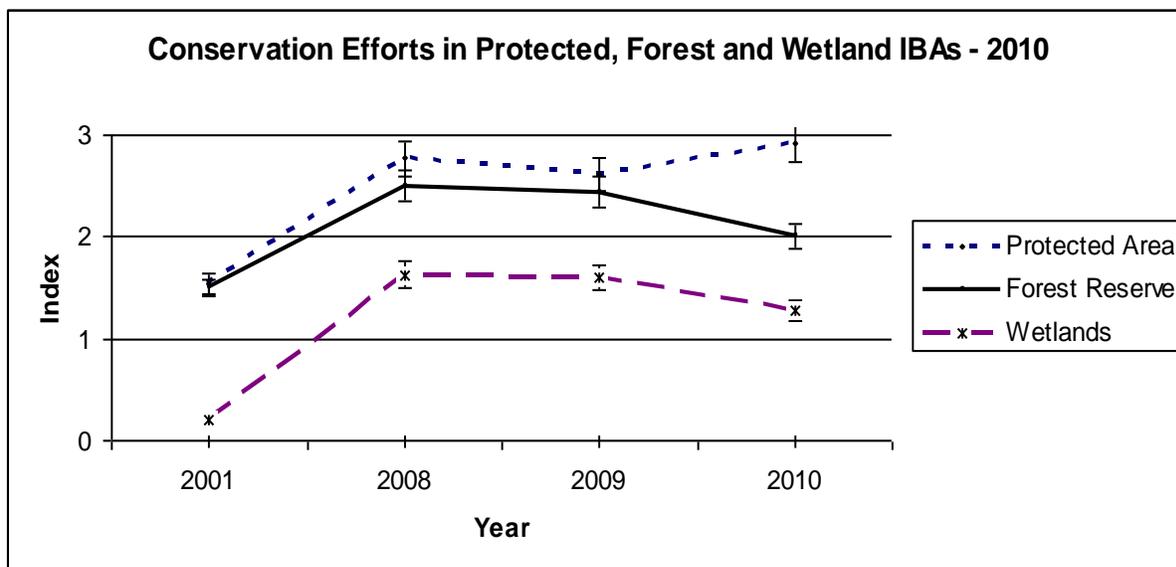


Figure 8: Conservation effort in wildlife protected areas, forests and wetland IBAs (*Nature Uganda*, 2010)

### 2.1.2 Forests

The forests comprise of both natural forest and man-made plantations. The natural forests which spread across the country comprise of tropical high forests (THFs) covering 924,000 ha (about 5% of Uganda’s land area), and woodlands covering 3,974,102 (about 19% of land area). The forest plantations cover 35,066 ha (about 0.2%).

There are two main management regimes of forests in Uganda namely; private ownership/ management and public/ government ownership/ management. The private forests may be located on privately owned land or public/ government land under lease or license. The private forests may be individually or communally owned. The public forests are managed by Central or Local Governments. Each forest is required to be managed under a management plan that states clearly the objective of management. Forests are managed at three levels and with a number of stakeholders namely; at national level, district and local levels. These different management regimes have a significant impact on the level on the biodiversity resources in the respective forests.

In 1900 Uganda’s forest cover stood at 50% of the total land cover equivalent to 12.1 million ha later reducing to 4.9 million ha in 1990 and further down 3.6 million ha in 2005. It is estimated that by 2012, given the rate of loss of forest, the forest cover was 2.97 million ha. The table below summarizes this information.

Table 2: Trends in the rate of loss of forest cover based on the above information\*

Year	1900	1990	2005	2012
Area under forests (Million Ha)	12.1	4.9	3.6	2.97
Percentage of total land area	50	24.1	17.6	14.5
Forest loss since 1900 (Million Ha)		7.2	8.5	9.1
Average Annual loss (Ha)		80,000	87,000	90,000

(NB: \*Projection by the Working Group basing on the information on trends to date)

Despite the estimated annual rate of forest loss being 80,000ha/ha for the period 1900 and 1990, it is believed that most of the forest loss could have happened between 1970s and early 1980s during political instability and lawlessness. However the trend as can be seen from the table above between 1990 and 2012, there is consistent increase in forest loss despite the prevailing political stability mainly due to population increase and its related pressures.

The decline in forest cover since 2000 has continued despite government commitment and investment to forest conservation over the last one decade. Such interventions include; SPGS, FIEFOC, Payments for Ecosystem Services (PES), Public-Private Partnerships in Central Forest Reserves, Gazettement of four National Tree Planting Days and Policy reforms. There on-going tree planting activities and programmes with the involvement of the private sector as well as Civil Society Organization (CSO). It is estimated that 60,000 ha over the last 10 years which is less than current rate of loss estimated to be between 87,000 - 90,000 ha annually.

The annual decline in total forest cover was at an average of 89,000 ha per annum (1.8%) for the period 1990 to 2005, with the higher rate of 2.2% in private forests compared to 0.9% in the protected areas. This clearly shows that forest on private and communal lands are under serious threat. As shown in Figure 7 is will decline further in the coming years as the human population increases and the population (especially the rural communities) seek for more land to grow crops to raise income to improve their livelihoods.

It is projected that if the current rate of 90,000ha/year on the remaining 2.96 million ha of forest is not reversed, Uganda may lose all the forests by 2040 which would have serious ecological and economic consequences. It is envisaged that the total area covered by natural forests and woodlands will continue to reduce as a result of land use change to agriculture and grazing, indiscriminate cutting of trees for timber ( furniture and construction) and fuelwood (firewood and charcoal, which provide over 96% of energy for cooking in Uganda). As the forest cover is being lost, this could lead into energy crisis (biomass energy).

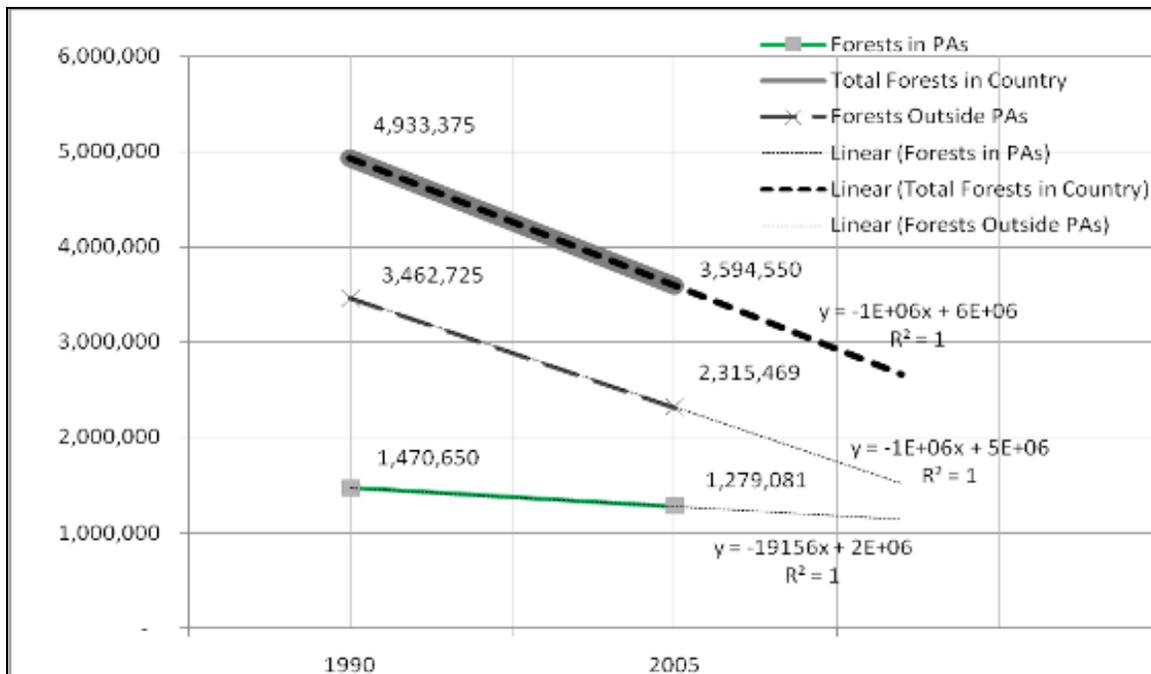


Figure 9: Status and trends of forests cover from 1990 to 2005 and linear projections to 2012 (NFA, 2009)

Deforestation and land degradation is estimated to cost 17% of the Gross Domestic Product (GDP). Land degradation is estimated to cost Uganda US\$ 625 million/year. Increases in demand for forest products for both domestic and commercial purposes are also a cause of deforestation. There is increase demand for timber for construction and furniture. It is projected that *per capita* forest area is to decline from 0.3 ha in 1991 to 0.1 ha by 2025 in the absence of any significant investments in forestry sector (Figure 10).

As reported in the fourth national report, once the forests on private lands and communal lands have all been destroyed, the pressure will be shifted to central forest reserves and wildlife protected areas. Thus protection of forests outside protected areas is critical and was pointed out in the fourth national report.

It was reported in the fourth national report that technical guidelines for management of private and community forests were in place but that challenge was the inadequate capacity of the District Forestry Services (DFS) at the district level to tackle the problem of deforestation outside protected areas (forests on private and communal lands). This situation has not changed mainly due to limited financial resources of districts to recruit more personnel and to support community based activities to manage forest outside protected areas. This scenario has resulted less progress made to address the major threats to forest biodiversity reported in the fourth national report namely over harvesting, invasive alien species and encroachment,

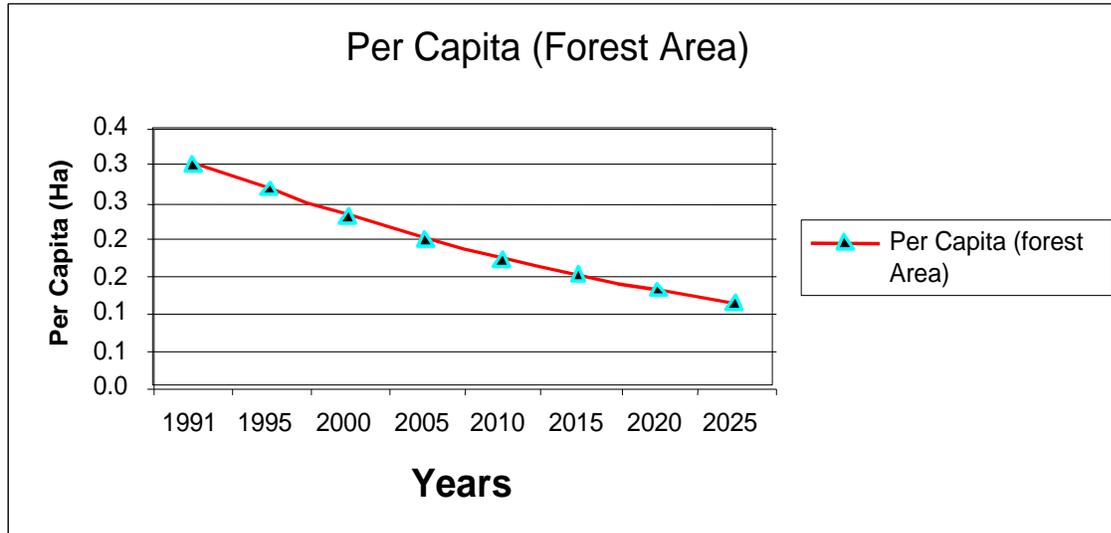


Figure 10: Per capita Forest area for Uganda (UBOS Records 2003)

Although the forest sector is facing challenges as pointed out above, there is opportunity to address the challenges both at the strategic and operational level. At the strategic level, His Excellency the President of the Republic of Uganda launched the National Vision 2040 on 18<sup>th</sup> April 2013. Vision 2040 aims at transforming the Ugandan society from a peasant to a modern and prosperous country within 30 years from now. Under Vision 2040, the people of Uganda desire a green economy and clean environment where the ecosystem is sustainably managed

Vision 2040 provides for the following interventions for Environment and Natural Resource (ENR) sector: expounding on the policies, laws, regulations and standards to guide the management of the environment, pursuing green economy as a tool for sustainable development and utilization of natural resources, restoration of degraded ecosystems (wetlands, forests, bare hills, rangelands among others), cooperation with international institutions and CSOs in Environmental management and strengthening institutional framework for the management of ENR sector.

Vision 2040 is to be implemented through 5-year NDPs. The current NDP (2010/11 -2014/15) has four objectives for forests a management:

- e) Restore forest cover from 3.6 million hectares (18%) to 4.9 million (1990 level-24%) hectares by 2015 with ultimate goal of achieving overall forest cover of 30%;
- f) Restore degraded natural forests in Forest Reserves and private forests;
- g) Reduce pressure on forest cover as a source of wood fuel and construction materials;
- h) Promote forestry based industries and trade.

The current NDP is now under review and this has provided the opportunity to strengthen Government investment in the ENR sector including forest management. Furthermore, the NBSAP has been revised and updated and specific national targets were developed on forests in

line with the Aichi targets especially Aichi targets 5, 7, 9, 11, 14 and 15 and the national targets stated above. Achievement of these targets will contribute to promoting sustainable use of forests and thus reduce loss of forests.

### 2.1.3 Wetlands

Up to late 1980s, wetlands were generally considered ‘wastelands’ to be reclaimed for agriculture in rural areas, and ‘drained’ as an anti-malarial measure in urban settings. By 1994, the need for conservation and sustainable use of wetlands was realized and this resulted in the formulation of a national policy on wetlands. In terms of ecosystems benefits from wetlands, approximately five million people in Uganda obtain free water from wetlands valued at US\$ 25million per year, making a saving of over US\$ 40 million in water scheme costs.

The wetland coverage on the surface area of Uganda was 15.6% in 1994 but has been declining. At the time the fourth national report was prepared, the wetland cover was estimated to be 29,000 sq. km, or 13% representing 2.6 % loss. Currently wetland cover is estimated to be 10.9% meaning 4.7% of the wetlands have been lost from the original 15.6% in 1994. In terms of wetland coverage as an ecosystem, what has been lost is about 30%. The changes have been attributed to massive wetlands degradation for rice cultivation and dairy farming with occasional conversion for human settlement, industrial development, local gin distilleries and sand mining.

Table 3: Trends in Wetland cover in Uganda\*

<b>Year</b>	<b>Total areas (km<sup>2</sup>)</b>	<b>% Surface Area of Uganda</b>
1994	37,575.4	15.6
2009	29,000	13.0
2014	26,307.7	10.9
<b>Loss</b>	<b>11.267.7</b>	<b>4.7</b>

(NB\* - Table generated by the Working Group basing on the information above)

.The rice grown in Uganda is both upland and paddy rice which requires lots of water to grow. It therefore means that farmers open up permanent wetlands in order to tap the water for growing the rice a reason for massive conversion of permanent wetlands. The seasonal wetlands have also been converted to grow rice and most of the time they have been drained to create dry land to grow other crops such as maize, sugarcane and sweet potatoes.

In addition, it is the seasonal wetlands that have been largely converted for settlement and industrial development. The percentage change in seasonal wetlands is 24.8% and this may not seem significant but has a lot of implications. Most of the seasonal wetlands are traditionally used for grazing and horticulture during dry periods of the year. Once permanently converted, there will be a time when grazing will be a problem to regions that have many pastoralists. The pastoralists depend on seasonal wetlands for pasture and watering livestock during dry seasons. This is a practice that has existed for generations but if nothing is done about it, there will be a crisis with maintaining pastrolism in Uganda.

Wetlands are referred to as granaries for water and this is true for wetlands in Uganda. The wetlands that exist in the upstream areas will usually serve to control floods in downstream areas as well as protect river banks from erosion. The wetlands in areas such as the slopes of Mt. Elgon and Ruwenzori used to serve these roles but today, there is hardly any intact wetland in these areas. The floods that are of frequent occurrence in the downstream areas of these two mountains can partly be attributed to the removal of wetlands along the riverbanks. A case in point is the river Manafwa originating from the slopes of Mt. Elgon which is highly silted and often bursts river banks to destroy all that is along its path. The recent floods in Butaleja district were partly a result of wetlands being destroyed from the river banks. The wetlands could have stored the water and released it slowly to reduce flash floods. The incidents of floods in Kasese district are also partly attributed to the destruction of wetlands along the river banks.

In eastern Uganda alone so far 20 % of wetlands have been destroyed mainly for rice production. Between 2000 and 2010 area under rice production increased from 72,000 ha to 140,000 ha. Elsewhere in the central region 2.8%, northern 2.4 % and western 3.6 % of wetlands have been destroyed. Rice demand increased from 47,000 tons in 1990 to 200,000 tons in 2000 and was estimated at 250,000 tons in 2011.

Rice is now a major food security crop with high urbanization and population growth rates, with export potential. Rapid urbanization and decline in production of food crops such as millet, cassava and bananas, have caused an increase in the demand for rice. Rice is an increasingly important source of income for rural poor households who have replaced production of other staple crops with rice.. It is should be noted the increased encroachment and degradation of wetlands is leading loss of ecosystem services provided by wetlands like water which is critical for rural agricultural production.

The pressures and threats to wetlands reported in the fourth national report namely unsustainable resource harvesting; habitat loss through agricultural conversion, industrial development and burning; and inadequate enforcement of legislation, regulations and compliance in wetlands use remain is on increase especially conversion of wetlands to agriculture and settlements. In the absence of investment and implementation of measure to address the threats to wetlands, the degradation of wetlands will continue to increase with adverse ecological impacts that will affect national development and human wellbeing. The Vision 2040 has target for wetlands is increase the wetland coverage to 13% (29,000 km<sup>2</sup>) by 2040. A Wetland Strategic Plan has been developed to guide investment and management of wetlands.

#### **2.1.4 Rangeland resources and livestock production**

Information on the importance and threats to rangelands was not reported in the Fourth National Report. Rangelands (referred to as the cattle corridor in Uganda) occupy an estimated 84,000 sq.km (43%) of the total land area of the country. They are characterized by low rainfall (between 300-700mm) making them semi-arid and therefore constituting the drylands in the country. Rangelands are very suitable for livestock production in Uganda. Livestock sector is an important component of the national economy. It is estimated to contribute 15% to the agricultural economy, representing about 5% of the overall national GDP.

Just like forests and wetlands, rangelands are under threat. In addition to overgrazing and agriculture, charcoal burning has emerged as the major threat to rangeland ecosystems. Charcoal production to feed the biomass energy demands of the urban population is on increase. Degraded rangelands will in turn affect livestock production in the country and consequently incomes of the poor local communities as well as potentially affected 5% of the GDP. In addition, pasture and water scarcities are contributing to frequent conflicts between cultivators and pastoralists and among pastoralists themselves.

Government has initiated programmes to promote sustainable use of the biodiversity resources in the cattle corridor as well as to address emerging threats and these include GEF support for sustainable land management and conservation and sustainable use of threatened savanna woodland in the Kidepo critical landscape.

## 2.2 Status and trends of species

### 2.2.1 Status and trends of large mammals

Uganda is reported to have 345 species of mammals which is 7.8% of the Global Mammal Diversity (39% of Africa's Mammal Richness. There are 30 species of antelope, 24 species of primates including charismatic species of Mountain Gorillas and Chimpanzees. In the fourth national report, the population of large mammals provided was up to 2006. In this report, additional information has been provided for the period 2007-2010 and 2011.

Table 4: Trends in population of large mammals from 1960 - 2011

Species	1960s	1982-1983	1995-1996	1999-2003	2004-2006	2007-2010	2011	Status in Uganda
Buffalo	60,000	25,000	18,000	17,800	30,308	21,565	21,639	Population increasing
Burchell's Zebra	10,000	5,500	3,200	2,800	6,062	11,814	n/a	Population stable
Elephant	30,000	2,000	1,900	2,400	4,322	4,393	n/a	Population stable
Rothschild's giraffe	2,500	350	250	240	259	984	n/a	Population stable
Hartebeest	25,000	18,000	2,600	3,400	4,439	4,099	4,001	Population stable
Hippo	26,000	13,000	4,500	5,300	7,542	6,580	n/a	Population stable
Impala	12,000	19,000	6,000	3,000	4,705	33,565	n/a	Population stable
Topi	15,000	6,000	600	450	1,669	845	n/a	Population stable
Uganda kob	70,000	40,000	30,000	44,000	34,461	54,861	54,080	Population stable
Waterbuck	10,000	8,000	3,500	6,000	6,493	12,925	13,128	Population

Species	1960s	1982-1983	1995-1996	1999-2003	2004-2006	2007-2010	2011	Status in Uganda
								increasing
Common Eland	4,500	1,500	500	450	309	1,409	n/a	Population stable
Bright's gazelle	1,800	1,400	100	50	n/a	n/a	57	Population precarious but recovering
Roan	700	300	15	7	n/a	5	20	Population precarious but recovering
Oryx	2,000	200	0	0	0	0	0	Extinct in Uganda
Black Rhino	400	150	0	0	0	0	0	Extinct in Uganda
Derby's eland	300	0	0	0	0	0	0	Extinct in Uganda
Northern White Rhino	300	20	0	0	0	0	0	Extinct in Uganda
Eastern Black Rhino	400	150	0	0	0	0	0	Extinct in Uganda
Southern White Rhino	-	-	-	-	8	11	14	This is a breeding population at the Rhino Sanctuary and its is increasing
Lion				600		416		Population declining fairly rapidly

Source: Uganda Wildlife Authority (2013)

In general the population of large mammals is stable but also increasing for some of the taxa although there is observed decrease in population in some of the large mammals like buffalo. In the fourth national report, the population of buffalo was 30,308 and this reduced to 21,565 in 2010. This can be attributed to incidences of poaching. This trend triggered response from Government. Law enforcement has been strengthened to curb poaching in protected areas and the population of buffalos is beginning to increase again. By 2011, the population of buffalo was estimated at 21,639. The population of common eland has more than quadrupled from 309 in 2004/2006 to 1,409 in 2010.

There was no information given on the population of lions in the fourth national report, this has been provided in this report. There is observed decline in the population of lions which can be attributed among others to straying of lions outside protected areas into local communities which has resulted into incidences of poisoning. Government has come up with sport hunting programmes and this is encouraging local communities to protect wildlife that stray outside protected areas. This is beginning to yield positive results as the population of large mammals is increasing where sport hunting is being implemented. This intervention was piloted in ranches neighboring Lake Mbuoro National Park and is being expanded to other protected areas.

The population of the elephants and the Topi sharply reduced from the 1970's to the 1990's. These populations however started recovering and substantial numbers have been registered recently as shown in Figure 9 below.

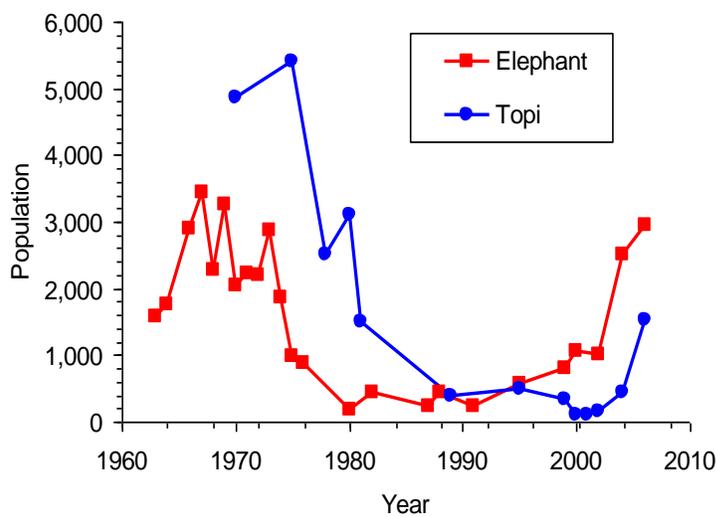


Figure 11: Trends in elephant and Topi population (WCS – MUIENR 2008)

As shown in Figure 10, the Buffalo and the Hippopotamus populations reduced but not sharply and more stable numbers are being registered. Unlike the rest, the Kob populations were not affected although the recent past show decreased numbers. A study is needed to establish the cause of this trend.

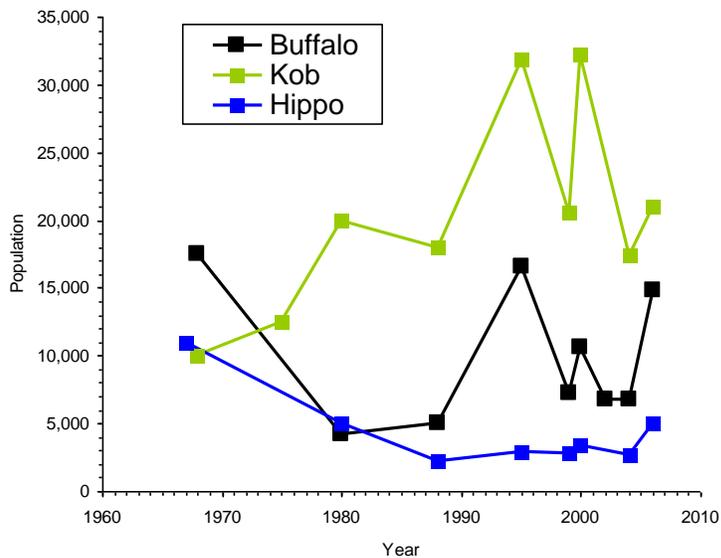


Figure 12: Trends in Buffalo, Uganda Kob and Hippotamus population (WCS – MUIENR 2008)

### 2.2.2 Status and trends of fishes/fisheries resources

Uganda’s fisheries resources are diverse in both aquatic ecosystems and fish species biodiversity. The fish diversity in Uganda is dominated by cichlid family consisting of 324 species of which 292 are endemic to Lake Victoria. In addition, there are 42 non-cichlid species spread in the vast aquatic resources of Uganda. Of these, 15 are endemic to Lake Victoria

Despite the over 600 fish species found in Uganda the major commercial fish species only include: Nile perch (*Lates niloticus*) from all the major lakes except Edward/George and some satellite lakes in the Victoria and Kyoga basin lakes; the small Nile perch *Lates macrophthalmus* (from L. Albert); Nile Tilapia (*Oreochromis niloticus*) from all major water bodies; Mukene (*Rastreneobola argentea*) from the Victoria and Kyoga basin lakes; Muziri/Mukene, (*Neobola bredoi*) of L. Albert; Catfish (*Clarias gariepinus*); Silver catfish (*Bagrus docmak*) from all major water bodies but currently very rare in lakes Victoria and Kyoga. The most common fish species to almost all the water bodies is the Lungfish (*Protopterus aethiopicus*).

Fisheries resources are among the most significant natural endowments of Uganda. The Ugandan fisheries industry is largely artisanal, based on inland capture fisheries from lakes; Victoria, Kyoga, Albert Edward, George and Kazinga Channel, rivers, swamps and flood plains all of which are critical habitats, breeding and nursery grounds for fish covering about 18% (42 000 km<sup>2</sup>) of Uganda’s total surface area. Overall, nearly 5.3 million people, including youth and women, are directly involved in fishing, fish processing and trading

The total fish production potential in Uganda stands at about 560,000 metric tonnes with about 82% (460,000 MT) contribution from the five water bodies/several small lakes and 18 % (100,000 MT) from culture fisheries. However production has averaged at about 220,000 tonnes per year after peaking at 276,000 tonnes in 1993. Total annual fish production is (beyond 2009) is lower than the Maximum Sustainable Yield (MSY) estimated at 330,000 tons shown in the figure below.

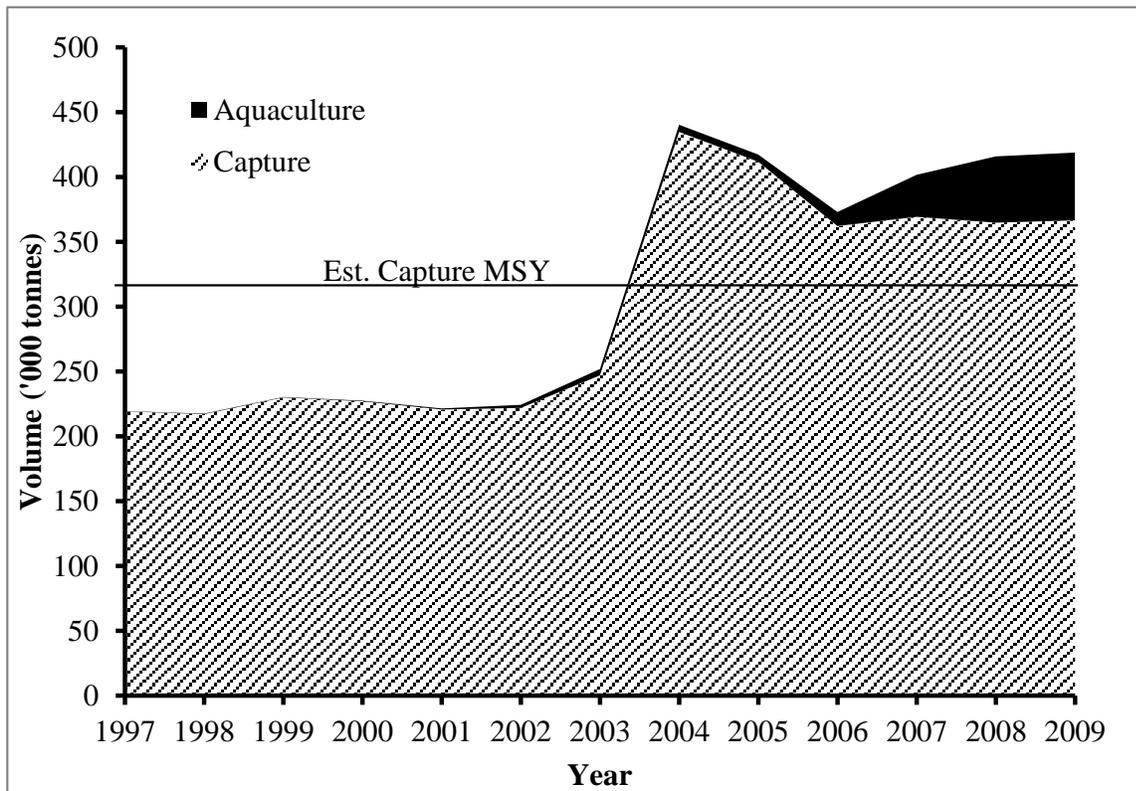


Figure 13: Trends in total volumes of capture fisheries and aquaculture in Uganda (UBOS 2010)

Aquaculture management is currently in a state of transition. The aquaculture sector in the 1980's was severely hampered due to inadequate financial resources to the sector resulting in weak training and support for extension service providers. Limited production of fish seed (fry) for distribution to small-scale farmers and poor pond management practices were the identified as major constraints. Political supports, supply of free seeds to prospective farmers, and increased technical training and guidance have resulted in re-invigoration of the sector. Currently, it is estimate that there are 2,000 ponds. The average pond size has tripled from 200 m<sup>2</sup> to 600 m<sup>2</sup>, with a number of emerging commercial farmers having numerous ponds of about 3,000 m<sup>2</sup> each. Production from these systems is estimated at 100 tons

Over the last 20 years fish/fish products have emerged as the second largest group to coffee in agricultural exports of Uganda. Between 2002 and 2007, fish accounted for 18.8% of commodity export value, second to coffee (22.3%). Fish has in addition been the first non-traditional export commodity with exports overseas increasing from US \$ 5.3 m in 1991 to US\$ 119.6 million in 2010 with the highest quantity (36,614 tonnes) and value (US\$ 143,168 million) in 2005. Fish exports to Sudan, Kenya, DRC and Rwanda were valued at about US\$ 50 million in 2007 and US\$ 30 million in 2011. The gross value of fish at landing sites is estimated at US\$ 800 million.

By 2007, the fishery sub sector was the largest export earner for Uganda with the major export being fish fillet to the international market mainly the Europe, Middle East, United States, Egypt and South East Asia. Exports increased from 4,687 tonnes in 1991 to 31,681 tonnes in 2007. They peaked in 2005 when 39,201 tonnes were exported valued at USD 143 million. This trend was equally impressive in 2011 by registering a 7 percent gain that is USD 126 million in 2010 to USD 136 million in 2011. This makes the sector the second export revenue earner after coffee. However, the exported volume increased by a mere 1 percent that is 21.3MT in 2010 to 22.5MT in 2011 which is attributed to fishing sanctions imposed by the Government to regulate overfishing in that year. Increased fish trade has led to substantial capital investments directed towards fisheries of the large lakes with 19 fish processing plants on the Ugandan parts of lakes Victoria and Albert.

However overall exports to international markets have recently declined sharply, falling from a peak of 39,201 tons in 2005 to about 15,417 tons in 2010. This is mainly attributed to declining catches, falling stocks, over-fishing and expanses of regional markets. Further volume and value of fish exports have continued to decline since 2005 mainly as shown in the figure below due to reduction in catches resulting from unregulated fishing activities and expanses of regional markets that largely comprise trade in immature Nile perch.

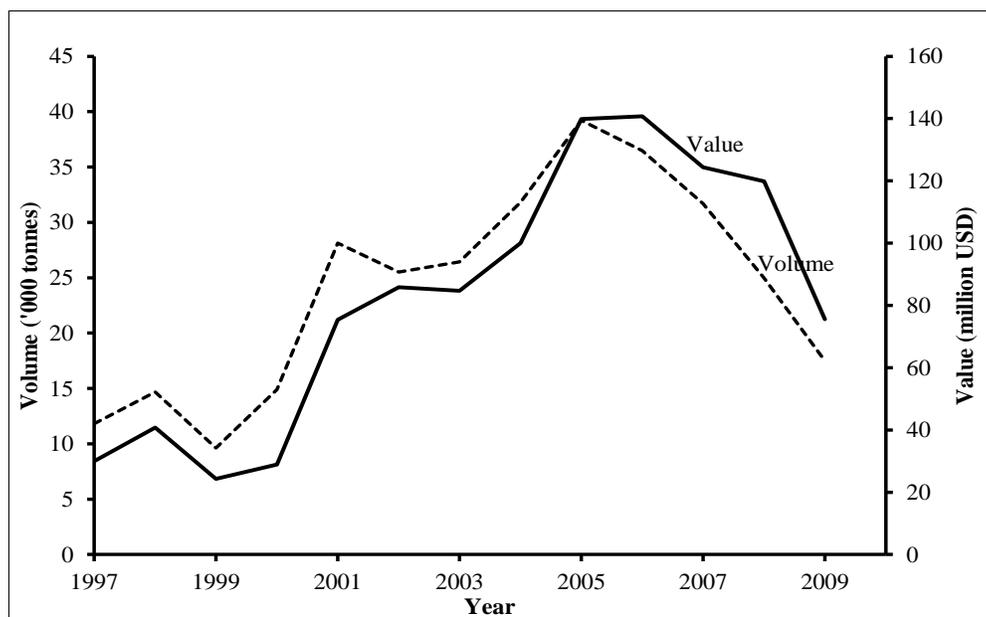


Figure 14: Trends in total formal export of Nile perch products from Uganda by volume and value

The decline in annual fish production is increasing fishing effort is exerting high fishing pressure on capture fisheries thereby causing fish scarcity and prompting use of destructive fishing gears and technologies. This has continuously led to increased investment and costs in fishing operations in an effort to catch scarce fish as shown in the figure below.

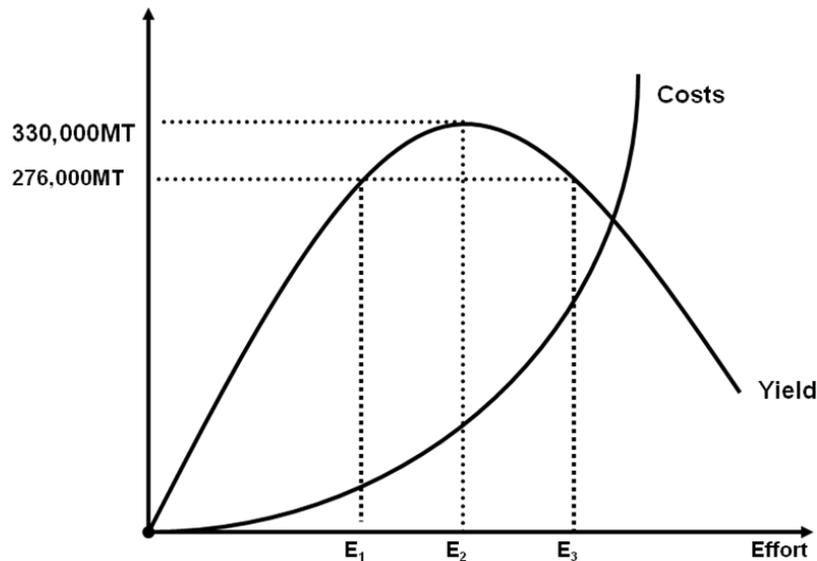


Figure 15: Impact of effort on fish production and operational costs

Thus although the fisheries sector is vital to Uganda's economy and people's livelihoods, it is facing a number of challenges. In addition to the threats pointed out the fourth national report, the fisheries resources sector is facing the following challenges:

- a) *Open access fisheries management regime*: This is a management regime whereby fishers gain access rights with relative ease after paying a nominal fishing license fees. It has led to many fishers competing for fish without consideration for long-term resource sustainability. This is opposed to closed access management regime where the number of fishers, boats and gears are controlled even after paying fishing license fees as it is the case on lakes George and Edward.
- b) *Declining fish stocks*: The fisheries resources in Uganda has been on a decline in stock of major commercial species. The Nile perch stocks on Lake Victoria for example have decreased from estimated 1.9 million tons in 1999 to 0.35 million tons in 2009 and this is affecting fish exports. Currently 40 percent of the catch of large species in the lake is immature fish. Available information indicate that use of illegal fishing gears and malpractices have increased over years. On Lake Victoria the illegal monofilament nets increased by 1,220 percent between 2004 and 2008. While small gillnets of 2.5 – 3 inches which catch young fish increased by 98 percent between 2004 and 2008

- c) *Increasing Fishing Effort*: The numbers of fishing factors/variables that combine to determine fishing effort hence fishing pressure has persistently been increasing on all water bodies largely due to open access and increasing human population in the country. The problem of many people chasing few fish poses a threat to sustainability of fisheries due to over-fishing.
- d) *Use of destructive fishing gears and methods*: One of the most damaging effects on the capture fisheries is use of destructive fishing gears and technologies especially when they are used in fish breeding and nursery grounds resulting in harvesting of young fish.
- e) *Pollution: water pollution*, degradation of lake shoreline and riverine wetlands leading to siltation, use of agro-chemicals industrial and urbanization in lake and river catchments combine to alter fish habitat conditions.
- f) *Inadequate data on fisheries*: The lack of realistic fish stock data for capture fisheries creates a weak basis for policy formulations, poor management decisions, under valuation of fisheries and limits sector growth due to inadequate financing.
- g) little is known about the fish diversity the minor lakes, rivers and swamps.

Government has proposed a wide range of intervention to address the above challenges and these include the following to promote sustainable use of the fisheries resources:

- (i) Restock lake Victoria and Kyoga with native fish species to replenish the stocks of fish fed on by Nile perch (Haplochromines, Mormyrids, Tilapias, Catfish, Carps, *Bagrus*, and *Labeo victorinus*).
- (ii) Establish and maintain proper base data/information on fish stocks, fish species reproductive biology and their resilience potential. Most of this information is either inadequate or lacking. The capacities (personnel, equipment and research funding) of the Department of Fisheries Resources and of the Fisheries Resources Research Institute have to be improved. The
- (iii) Strengthen fisheries co-management. Fishermen are important stakeholders and all efforts must be geared towards ensuring their full participation in the management of the fisheries.
- (iv) Promote and support aquaculture. Cage aquaculture in the lakes currently under trial should be pursued further and appropriate mitigation measures of its impacts be developed.
- (v) Restrict entry into the fishery therefore limiting effort. Entry must be restricted stringent licensing requirements.
- (vi) Gazette a limited number of landings to reduce and concentrate landing sites to facilitate monitoring surveillance and control.
- (vii) Establish no fishing zones especially fish breeding areas and protect them from destructive fishing.
- (viii) Introduce closed fishing seasons.
- (ix) Gear size control slot size control to be applied to all fish major fisheries but not rather to commercial fish species.
- (x) Establish regional fisheries management institutions (like Lake Victoria Fisheries Organization on Lake Victoria) and harmonize policies and laws governing trans-boundary

fisheries. The same should be done between Democratic Republic of Congo (DRC) and Uganda over Lakes Edward and Albert.

### **2.2.3 Medicinal plants and traditional medicine**

Medicinal plants were not included in the fourth national report. Whereas there is scanty information on the quantity of medicinal plants consumption, majority of people in Uganda rely on it for primary health care. It is estimated that 80% of Ugandans depend on indigenous medicine. Medicinal plants are less costly and more accessible than allopathic. Regional traditional medicine community centres have been established. This is an outcome of project on Medicinal Plants and Biodiversity funded by IDRC.

With the emergence of HIV/AIDS and other non communicable diseases like diabetes, cancer and hypertension, and the inaccessibility of allopathic medicine, patients have turned to indigenous healing systems (that predominantly depend on local medicinal plants) to treat HIV related opportunistic diseases and infections. This is in addition to the treatment of zoonotic and other diseases like malaria, abdominal pain, skin diseases, headache, worms, ulcers, epilepsy, among others.

Despite the importance of medicinal plants, about 1% of the 250,000 species of higher plants known to have medicinal values have had their biomedical potential determined. The remaining 99% is disappearing rapidly together with the associated knowledge and practices. The causes of disappearance range from habitat loss to unsustainable harvesting. Emphasis is on collection from naturally existing stock with minimal deliberate strategies focused on the conservation of targeted species. Poor methods of processing, packaging and marketing of medicinal plants not only results in losses but also limits the acceptability and marketing of medicinal plants.

Government of Uganda recognizes the need to establish standards for use, safety, efficacy and quality of such traditional remedies. NCRI carries out efficacy, safety and phytochemical screening of herbal remedies, and advises on formulation and preserving and standardization of medicinal products from plants. Collaboration with traditional medicine practitioners have been established by Government through NCRI with the following objectives: for awareness raising on sustainable use and propagation of endangered medicinal plants.

- a) To encourage an approach to evaluating and improving the safe, effective, and sustainable use of medicinal plants in Uganda that integrates the professional expertise and knowledge of traditional health practitioners with that of health workers;
- b) To identify the most common diseases and the medicinal plants used by the traditional healers to treat them in the selected project areas, and to identify a small number of target remedies for research on conservation, safety and efficacy based on anticipated benefits to health care in Uganda;
- c) To assess the collection, trade, and conservation status of the target medicinal plants
- d) To strengthen the capacity of NCRI to develop and implement valid, ethical, and feasible protocols for evaluating the safety and efficacy of indigenous health remedies in Uganda;

- e) To clarify and establish equitable arrangements for intellectual property ownership and benefits from information contributed to research by traditional health practitioners and indigenous local communities;
- f) To disseminate the research findings concerning safe, effective, and sustainable use of the targeted indigenous health remedies among current and potential users, including traditional health practitioners, community health specialists and practitioners of allopathic medicine within Uganda and internationally.
- g) To propose guidelines for the sustainable harvesting of medicinal plants and improved preparation of indigenous medicinal remedies.

There is on-going effort to promote indigenous medicine. A law for the recognition, protection and practice of indigenous medicine has been developed by the Uganda Law Reform Commission. NARO is integrating the modernization and commercialization of indigenous knowledge for wider economic and social benefits in areas such as food production, cosmetics, pharmaceuticals, aromatics and handcrafts. Uganda National Drug Authority (NDA) has a Committee on Indigenous Medicine to oversee activities related to use of Indigenous medicine in Uganda. Several NGOs and CBOs are involved in efforts aimed at promoting the conservation of medicinal plants, particularly those that are highly threatened. There have been efforts to propagate threatened species such as *Prunus africana*. The key outcomes of the interventions on indigenous medicine are: Increasing acknowledgement and recognition in the country of the role of medicinal plants in the national healthcare system. Interest in indigenous medicine in general and in medicinal plants in particular has increased as more people have turned to using such remedies.

A national policy targeting indigenous and complementary medicine is in place and has increased awareness on the need to have of legal framework. A national bill on indigenous and complementary medicine in Uganda has been developed. The Bill has the following goals:

- a) integrate indigenous medicine/medicinal plants products and practitioners into the commercial sector to enhance income at the individual, community and national level and improve health in the country;
- b) mainstream indigenous medicine into national health care delivery system;
- c) put in place mechanisms for conservation and sustainable utilization of indigenous medicine and medicinal plants recognizing that economic, social development and poverty alleviation are the first and overriding priorities of the nation;
- d) provide for protection of Intellectual Property Rights, equitable access and benefit sharing arising from the use of Indigenous knowledge, innovation and practices relevant to the conservation of indigenous medicine and medicinal plants;
- e) establish a framework that promotes the participation of local communities at all levels of policy making and implementation of the conservation and sustainable utilization of,

production, domestication and commercialization of Indigenous medicine and medicinal plants;

- f) facilitate research, technology transfer in indigenous medicine and medicinal plants;
- g) provide for linkages into national, regional and international programmes with a view to enhancing partnership and technological inputs into indigenous medicine and medicinal plants; guarantee the supply of indigenous medicine, which is safe, effective, of high quality, widely available and affordable.

#### **2.2.4 Status and trends of pollinators**

A pollinator is biological agent that moves pollen from the male of a flower to the female of a flower to accomplish fertilization. The most recognized pollinators are the various species of bees while others include bees, butterflies, moths, wasps, and bats, birds particularly humming birds, honeyeaters and sunbirds. Pollinators are very important in agricultural production and their status is therefore of concern not only to the farmers but to the Government as it has a direct impact on people's livelihoods and the economy.

The value of pollination to agricultural production worldwide is currently estimated to be worth €153 billion per year. However agricultural production and agro-ecosystem diversity are threatened by declining populations of pollinators. The major contributors to this decline in pollinator populations are, *inter alia*, habitat fragmentation, agricultural and industrial chemicals, parasites and diseases, and the introduction of alien species.

In a study by the National Environment Management Authority (NEMA) in 2009 on the integrated assessment of the potential impacts of the EU ACP Economic Partnership Agreements (EPAs) on Uganda's biodiversity, local communities raised concern that pollinator bees were found disappearing from flowering growing areas hence affecting other agricultural activities near the flower growing areas. A study has been commissioned by NEMA and findings so far indicated the need to carry out a rigorous study and assess the potential impacts of all the agro-chemicals used by the flower industry. The expected outcome will be to phase out those agro-chemicals that have adverse impacts on pollinator bees.

#### **2.2.5 Status and trends of birds**

Uganda has 1,057 bird species, representing 10% of the world total. Of these, 27 species are yet to be confirmed. Out of the bird species in Uganda, 15 are endangered and 11 are vulnerable. New species however keep being added to the Uganda list and therefore the total number of species continues to grow as additional records are confirmed. The diversity is a result of the location of Uganda on the confluence of major vegetation zones at the heart of the continent and good climatic conditions.

Several species are classified as threatened both at the global and regional levels. Those globally threatened include Shoebill *B. rex*, Grey-crowned Crane *B.regulorum*, Lesser Flamingo *P.minor*, Great Snipe *G.media*, and African Skimmer *R.flavirostris* (IUCN Red Data list), which are all decreasing in Uganda. At the regional level, species such as White-backed Night Heron *G.leuconotos*, Rufous-bellied Heron *A.rufiventris*, Black Heron *E.ardesiaca* and Goliath Heron *A.goliath* are threatened. Globally threatened species in Uganda are as in appendix 15.

### *Migratory species*

During the Palearctic winter, Uganda receives many migrants, some just on passage to areas further south, while others spend the entire winter months in the country. These are mainly waders, ducks, gulls and terns. The White-winged Tern *C. leucopterus* and Gull-billed Tern *S. nilotica* are often recorded in huge numbers, especially at Lutembe Bay. Some Palearctic wading birds such as the Great Snipe *G. media* which is globally threatened and the *Whimbrel numenius phaeopus* occasionally sighted, while other migrants like the Slender-billed Gull *L. genei*, a species which was only recently added to the Uganda list, is being recorded with some regularity. Migrant birds by their very nature are liable to suffer number fluctuations, both on their travels and breeding grounds and we should endeavour to protect their wintering areas.

### *Important Bird Areas (IBAs)*

The Important Bird Areas, initiated over 15 years ago, has contributed immensely to protection of biodiversity in Uganda. There are now 34 IBAs in Uganda. The programme produced a National Directory, advocated for better policies, initiated conservation and livelihood improvement programmes and raised the profile of ten wetlands that are IBAs into Ramsar sites.

Three status ratings have been considered; Favourable, Near Favourable and Un-favourable. The IBAs are generally in good conditions (45%) compared to the previous years. This is encouraging since the condition “Favourable” have improved although the figure of 55% in 2001 remains unattained. Another encouraging trend is also being seen in “Un-favourable” rating down in 2008 and then down further in 2010, from 17% in 2001 to 8% in 2008 and 13% in 2009 and now 6%. “Near Favourable” conditions in 2010 with 49% and 55% in 2009 and yet this took most of the IBAs in 2008 (72%) noting that most of them have improved, shows that with concerted conservation measures, all may not be lost.

IBAs and bird conservation in general is threatened by several factors including agricultural expansion, livestock grazing, deforestation, wetland drainage, pollution from agro-chemicals, fires, human settlement, infrastructural developments, tourism and extractive industries. Lutembe Bay remained the most threatened IBA while the least threatened remained Mgahinga National Park. The population trends of some selected bird species are shown in Figure 11 and 12.

### Great White Pelican in Queen Elizabeth NP

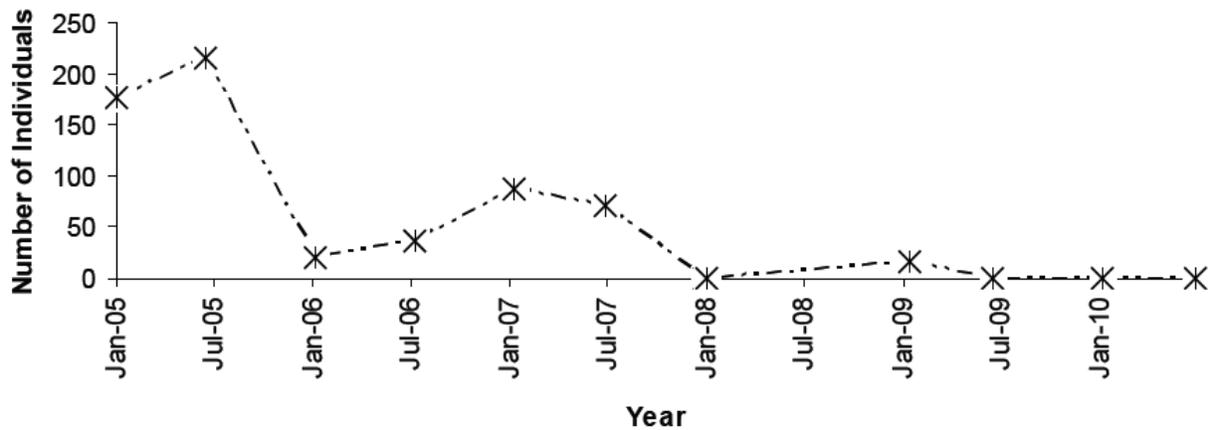


Figure 16: Population trends of White Pelican in Queen Elizabeth National Park (NatureUganda 2010)

### Gull-billed Tern *S.nilotica* in Lutembe Bay

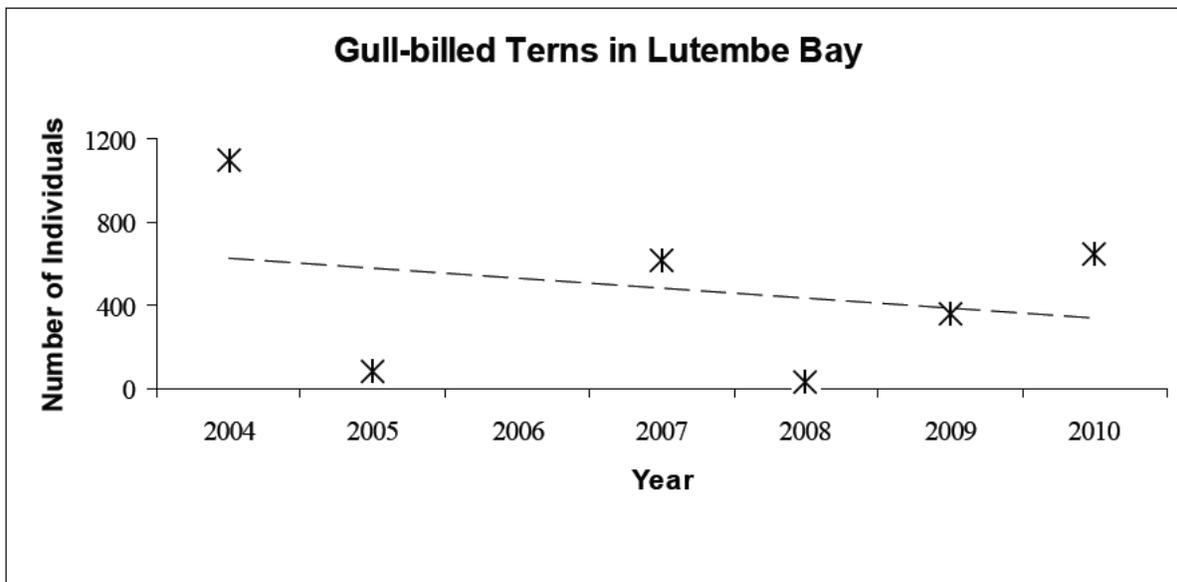


Figure 17: Population trend of Gull-billed tern in Lutembe bay (NatureUganda 2010)

## 2.3 Climate change

The information on climate change in the Fourth National Report was generic and focused mainly on international level and less on the national circumstances. The fifth National Report has attempted to address these gaps by providing more information on the linkages between climate change and biodiversity, case studies are also presented.

In Uganda, the average temperature in semi-arid areas is rising, especially in the southwest and Northeast. Uganda's National Adaptation Programme of Action (NAPA) cites an average

temperature increase of 0.28°C per decade in the country between 1960 and 2010, with the months of January and February most affected by this warming trend, averaging an increase of 0.37°C per decade. The frequency of hot days in the country has increased significantly, while the frequency of cold days has decreased.

Historical records of Uganda's glaciers show that the ice caps on the Rwenzori Mountains have shrunk significantly in the last 100 years. The percentage of ice loss is highest on Mount Baker (96%), followed by Mount Speke (91%), Mount Stanley has the lowest percentage of ice loss (68%), hence affecting biodiversity and ecosystem services. It's evident that the climate has changed and projected to continue to change if no actions are taken. Some of the key sectors which have been identified as being vulnerable to Climate Change impacts in Uganda that are important for ecosystem security are; forestry, water, wildlife and agriculture.

Changes in rainfall and temperature patterns are being observed across the country albeit with some challenges e.g lack of enough meteorological stations in the various districts, making efficient tracking of weather and climate variabilities a dare task. Rainfall has decreased, becoming more unreliable and less evenly distributed. Floods and landslides are on the rise with increasing intensity. Since the year 2000, erratic rains have been regularly experienced in eastern Uganda, with an increase of approximately 1500 mm of precipitation in the December to January rainfall season. El Niño–Southern Oscillation events have also become shorter and more irregular.

Droughts conditions are on the rise in the western and north-eastern regions of the country, which are biodiversity hotspots. The northern region has also been experiencing more frequent and longer-lasting droughts than historically recorded. Between 1991 and 2000, there were seven droughts in the Karamoja region, other major droughts occurred in the years 2001, 2002, 2005 and 2008. Although Uganda has always experienced droughts, scientific evidence suggests that in the recent past, they have been more frequent and severe. The increased frequency and duration of droughts is the most significant climate-related change being experienced in Uganda, significantly affecting water resources, biodiversity and agriculture, among other sectors.

The mean annual temperature is projected to increase from 1.0 to 3.1°C by the 2060s, and 1.4 to 4.9°C by the 2090s. Uganda being an agro-based economy, the increase in temperature will have adverse impacts on agricultural production which in turn will have impacts on livelihoods and revenue for government. Coffee is Uganda's most important cash crop. In the 1980s, the government estimated that farmers planted approximately 191,700 hectares of robusta coffee, most of which was grown in the low lands of south-eastern Uganda, and about 33,000 hectares of Arabica coffee in high-altitude areas of eastern and south-western Uganda. By 2012, the registered area under coffee growing was; 178,125 ha, 182,875 ha, and 187, 260 ha in 2009, 2010 and 2011 respectively.

A temperature increase of 2<sup>0</sup>C can have a dramatic impact on coffee growing areas as depicted in the Figure 13 below. This also applies to other ecosystems and ecosystem services, hence having a negative impact on the social and economic development of Uganda.

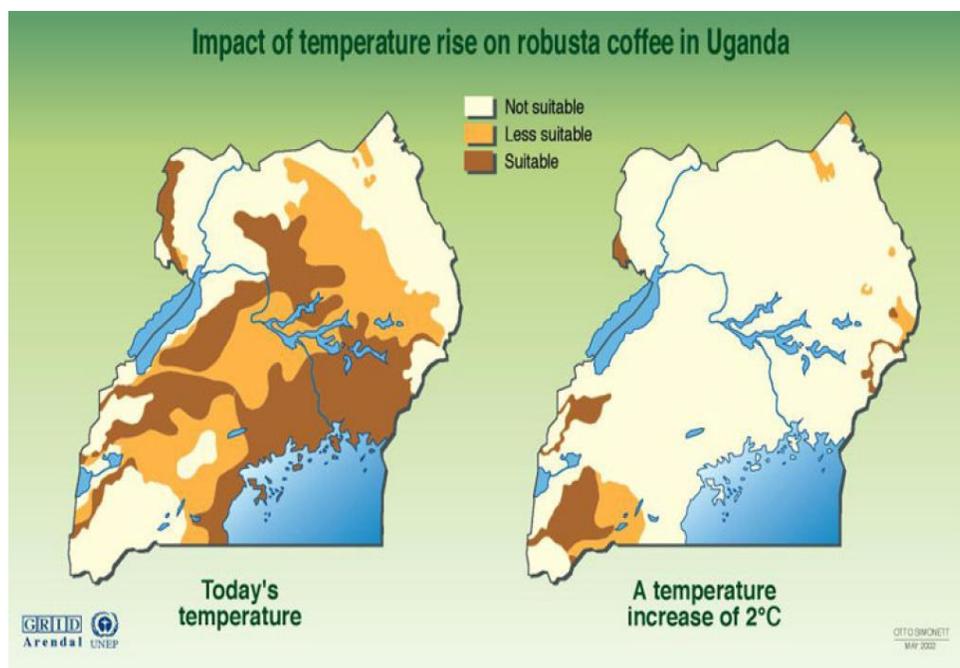


Figure 18: Potential impacts of temperature rise on Robusta coffee growing Areas in Uganda (Source Otto Simononett 1989)

According to the survey undertaken by Oxfam Uganda in 2012, climate change will have an impact on the suitability of Arabica coffee growing areas in Uganda, including the Rwenzori Mountains. Most areas will become less suitable, and particularly those at lower altitudes (1500m) will be severely affected. The annual export value for Arabica coffee in the year 2010/2011 was US\$161,676,750. If climate-induced yield losses occur in the order of 10–50%, as reported by AFCA, these will affect Uganda’s foreign exchange revenue potentially in the range of US\$15–80m per year.

Low altitude areas that are currently still suitable for Arabica coffee require climate change adaptation strategies in order to sustain the livelihood of farmers depending on Arabica coffee. The lowest Arabica growing areas (<1300m) are likely to become completely unsuitable and farmers may have to switch to other crops. On the other hand, areas that are currently often considered too cool (>2100m) will see suitability improvements in the decades to come, for example the south western region of the country.

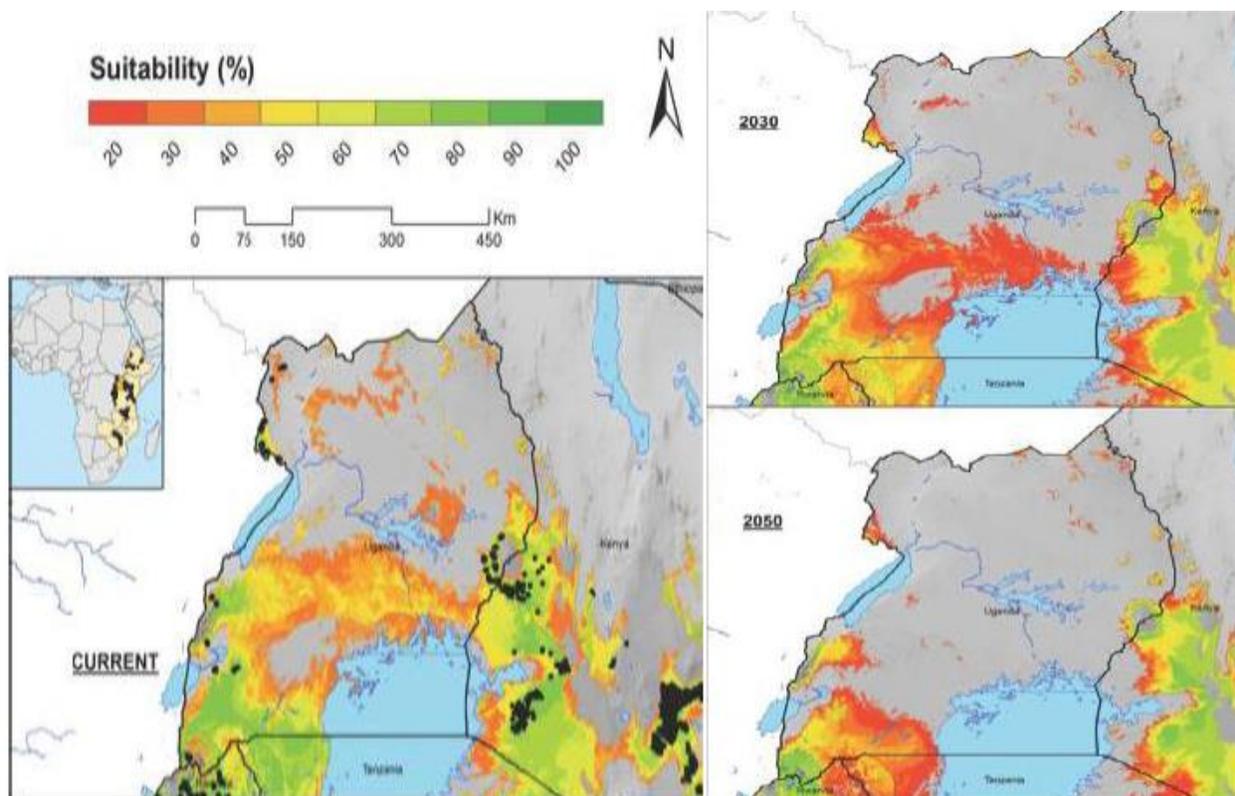


Figure 19: Predicted suitability for Arabica coffee production in Uganda in 2012, 2030 and 2050 (Source: Oxfam Uganda 2012 )

The figure above figures illustrate that if the same coffee production systems are kept with the same coffee varieties (this means that nothing changes and coffee production systems stay the way they are currently), then the areas suitable for Arabica coffee will drastically change and become less suitable. The green (more suitable) areas in the figure become smaller when projected to 2030 and 2050 compared with the map showing current suitability. The yellow, orange and red (less suitable) areas increase. Climate variability and climate change has impacts on Uganda’s biodiversity as illustrated by the two case studies below.

### **Measures taken to address climate change impacts on biodiversity**

- f) Uganda is developed a National Climate Change Policy. Biodiversity and ecosystems' integrity and its importance to adaption and mitigation of climate change impacts have been highlighted in the policy.
- g) The NAPA has been piloted in three ecosystems comprising of semi-arid, lowland and mountainous ecosystems. The purpose was not only to strengthen communities' resilience to adverse impacts of climate change, but also to strengthen biodiversity and ecosystems' resilience to effectively adapt to climate change impacts.
- h) Ecosystem based Adaptation (EBA) projects are currently being implemented in Mt. Elgon and Mt. Rwenzori regions focusing on biodiversity and ecosystems' service through management, conservation and restoration.
- i) The national REDD+ strategy for Uganda has been finalised. Its main emphasis is on forestry conservation and restoration on both public and private lands.
- j) Climate change mainstreaming into sector policies, plans and programs is in progress, with key sectors like agriculture, forestry, energy, education, wetlands among others being encouraged to consider biodiversity conservation into their plans and policies.

### **2.4 Summary of threats to biodiversity**

- a) *Encroachment*: Loss of habitat is perhaps the serious negative factor and is certainly the most difficult to halt and reverse. Encroachment is prevalent in all types of PAs. There was much clearance of forest cover to make settlements in the forest reserves during Uganda's civil strife of the 1970s and 1980s; residual encroachment in PAs still continues. Most of the boundaries of the encroached reserves have not been reopened and are not clearly demarcated, and this forms part of the reason for the current challenge of protecting these areas.
- b) *Human-wildlife conflicts*: The perennial crash between human beings and wild animals continues to present stiff challenges in the management of PAs. Given the high population growth, many communities have ended up establishing farms and settlements very close to the boundaries of the PAs resulting in destruction of crops by wild animals especially elephants, hippos and buffaloes. This has prompted the local communities to either poison the animals or become antagonistic towards conservation programmes.
- c) *Illegal grazing in National Parks*: Communities neighbouring PAs continue to graze their domestic animals inside the game parks and reserves, and in most cases intruders are not deterred by fines. A number of factors contribute to the intrusion into PAs. These include disregarding the existing laws, failure to recognize the importance of the areas and desperation due to lack of other pasture options, among others.

- d) *Poaching and illicit trade in wildlife*: Poaching is a serious problem in the wildlife areas and is largely attributed to the demand for products from wild animals and plants for food, cash, medicine and game trophies.
- e) *Use of destructive fishing gears* and technologies especially when they are used in fish breeding and nursery grounds resulting in harvesting of young fish. Open access fisheries management regime has led to many fishermen to compete for fish without consideration for long-term resource sustainability
- f) *Deforestation* due to high population growth rate and the rapid development in Uganda, the forest sector faces a huge problem of overharvesting through deforestation to satisfy the high demand for forest land for agriculture and forest products like charcoal, fuelwood and timber. Deforestation of the widely abundant woodlands is very rampant for the production of charcoal and conversion to agriculture and grazing land. About 78% of Ugandans are said to use firewood for cooking, a highly contributing factor to deforestation.
- g) *Urbanization and Industrialization* have exerted great pressures on mainly peri-urban forest reserves for expansion of urban and industrial centers.
- h) *Alien species introduction*: Several tree and other plant species were introduced in the colonial times for example the eucalyptus, that have adopted quite very successfully, colonizing and dominating over the indigenous species for example *Lantana camara*.
- i) *Encroachment of wetlands* due to extended demand for land for grazing and agriculture with majorly rice in Eastern region, dairy farming and Vegetables in South West and postural land in the North and East)
- j) *Drainage of wetlands* in urban centers especially in the central region, driven by the force of urban expansion or development that's to say industrial expansion and infrastructure development like roads industries and housing settlements.
- k) *Replacement of local crop varieties* by introduced commercial varieties (e.g. nematode and disease resistant varieties of banana, cassava, maize, beans). This leading to Loss or neglect of traditional varieties, including crop wild relatives and landraces e.g. millet, cowpeas, pigeon peas, Lima and Bambara beans, and wild medicinal plants and local fruits and vegetables (e.g. *Solanum nigrum*, Ginger lily through wetland destruction, Cape gooseberry by fire and overgrazing and introduction of exotic species such as tomatoes and cabbages);
- l) *Loss of other indigenous species* found in cultivated areas (e.g. *Crotalaria jaburniflora*, *Thumbergia alarta* and *Eluophia streptopetala* (internationally protected), as well as increasing problems of invasive crop weeds (e.g. parasitic *Striga*, Couch grass and *Lantana camara*).

- m) *Poverty* - Large proportions of Ugandans live below the poverty line and are ignorant of the importance of conserving biodiversity. It is usually the best animals that are sold off for slaughter or sacrificed during difficult times thus leaving inferior ones to form the economic base. The ability of the owners to cope with the socio-economic demands keeps on dwindling as they dispose of more animals without replenishment capacity.
  
- n) *Introduction of new breeds* - The long-term viability of animal agriculture in Uganda depends strongly on the genetic variability of the indigenous animals being reared. However, this genetic base is now being rapidly eroded as breeds developed for intensive management regimes are replacing local races of livestock. The small number of improved breeds does not offer sufficient genetic reservoir for future breed improvement. Even the national semen bank mainly holds stocks of imported exotic semen. There are only a few stocks of semen of indigenous animals. Uganda has no stocks of cryo-preserved embryos.
  
- o) *Systematic breed substitution and irrational genetic transformation* - Due to the high demand for livestock products to feed the rising human population growth, cross breeding and breed replacement are increasingly being encouraged and intensified in Uganda. This has given rise to increasing numbers of crosses and exotic animals at the expense of the indigenous animals. This systematic breed substitution, although the threat is still small, could wipe out the local population in future if no adequate precaution is taken. There is fear that the rate of adopting exotics coupled with cross-breeding the exotics with indigenous breeds might accelerate the rate of displacement of the indigenous species by the introduced breeds.

### **3. IMPLICATIONS OF BIODIVERSITY LOSS TO HUMAN WELL-BEING**

#### **3.1 Livelihoods and wealth creation**

Biodiversity is critical for human being and national development (including having the basics for good life, health, good social relations, security and freedom of choice). It thus provides various products coupled with ecosystem functions of provisioning, regulation, aesthetic/intrinsic and support functions. Biodiversity and its components are the foundations for livelihoods of the biggest proportion of the population given their subsistence way of life. The biggest proportion of the population which lives in rural areas solely depend on biodiversity in its raw form in terms of food, agriculture, culture values, health and shelter among others.

#### **3.2 Food Security**

Biodiversity plays a critical role in ensuring food security as demonstrated by Uganda's nature based agriculture sector. Uganda is among the countries with the lowest level of fertilizer use estimated at 1.5kg/hectare/year (NDP 2010/11 – 2014/15) coupled with a negligible area under irrigation. The agriculture sector therefore thrives on natural soil fertility which are enhanced by micro-organism like earth worms and other underground biodiversity. Similarly, different ecosystems like wetlands, forests and mountains have over the years played an instrumental role in enhancing the much needed precipitation in the agriculture sector. All these have accelerated Uganda's efforts in achieving the recommended daily caloric intake.

Crop diversity is critical in maintaining crop resistance to pests and diseases while adaptive species act as cushion to food insecurity in the face of climate change. However, the rampant biodiversity degradation through unsustainable management of agriculture and other ecosystems have not only plummeted food production over the years but also accelerated climate change impacts manifested in Uganda today. Uganda's population is projected to reach 60 million people by 2040. This presents an imminent rise in food demand which is likely to exceed supply if biodiversity loss is not contained. There is therefore need for increased awareness and commitment to conserve biodiversity at all levels to avert the looming food insecurity.

#### **3.3 National Development**

Uganda's natural resource based economy highly depends on biodiversity based sectors such as: Agriculture, tourism, forestry, fisheries, rangelands, wetlands and water resources. Over the years, Uganda's economy has experienced varying growth rates. From independence in 1962 up to 1971, Gross Domestic Product (GDP) grew by an average of 5.2 per cent per annum. However, between 1971 and 1979, GDP declined by 25 per cent due to the unstable political situation and economic mismanagement. From 1981 to 1983, Uganda experienced GDP growth rate of 5.5 per cent but recorded negative growth rates in 1984 and 1986. Between 1987 and 1996, GDP grew at an average of 6.5 per cent translating into 3.4 per cent growth in per capita terms.

The contribution of the ecosystem to the national economy in Uganda is exemplified by the fact that livelihoods of many Ugandans are intimately tied to the environment both as a source of subsistence of household requirements including food and fuel, and as a basis for production as shown in the table below. .

Agriculture has been and continues to be the most important sector in Uganda's economy. Agriculture is basically subsistence in nature with smallholder farmers dominating. In 2010/11, the sector accounted for 22.5 percent of total GDP. The National Development Plan (NDP) 2010/11 -2014/15 recognizes and classifies it as the lead growth sector in the socio-economic transformation of Uganda. Agricultural exports accounted for 46 percent of total exports in 2010. The sector is also the basis for much of the industrial activity in the country since most industries are agro-based.

The agricultural sector is dependent on a healthy and productive environment in terms of soil erosion, water, pollination services among others. Despite the critical functions and values of ecosystem services to the agricultural sector, there are serious issues that are affecting and will continue to affect the ecosystem security and therefore food security in Uganda.

Uganda aspires to transform from a peasant to a modern and prosperous country within 30 years. This transformation entails an overhaul in the operation of primary sectors of the economy such as agriculture, tourism, fisheries and environment of course. There is a lot of untapped potential in Uganda's Biodiversity that can be harnessed to spur economic development and transformation. Biodiversity conservation should therefore be an integral part of all development initiatives to ensure that benefits of national development culminate into socio economic transformation for prosperity across all segments of the population. Biodiversity is the basis of different sectors of the economy most notably Agriculture, fisheries, forestry, wetlands, tourism and health in addition to supporting the achievement of international development goals like MDGs.

Biodiversity supports economic output indirectly because it provides secondary inputs to processing industries most of which are agro and natural resource based. The quantified value of the direct economic benefits of Uganda's biodiversity is more than US\$ 548.6 million per annum while the indirect benefits – the ecosystem services and functions therefore support and maintain human production and consumption - are estimated at US\$200 million per annum..

Biodiversity provides the material - genetic diversity among crops and animals, diverse species of animals and crops, and ecosystem functions that support agricultural activities. It further avails different types of Fungi, algae and micro – organisms that support soil formation, decomposition of organic matter, soil texture, health and fertility. In addition, agriculture depends on Biodiversity for pollination, watershed control and as a source of biotechnology development. These components of biodiversity have enabled agriculture to play its development role in Uganda's economy over the years. The sector contributed 22.9 percent of total GDP in 2011 at current prices in addition to employing 65.6 percent of the total working population. In 2010/11, the sector also accounted for 40 percent of total export earnings.

Forestry contributes up to 6 percent of Uganda's GDP and employs about 100,000 people directly and another 750,000 indirectly. Equally, the sector provides wood fuel which meets the energy needs of over 90 percent of the population in addition to acting as a water catchment area thus playing an indirect role in the provision of hydroelectricity another source of energy.

The forestry sector fosters industrialization through provision of raw materials for various industries. Pharmaceutical industries like Kampala Pharmaceutical Limited derive some of their raw materials from forests; the crafts and paper industry also thrive on forestry raw materials. It is also a habitat to pollinators necessary for maintaining production in agro ecosystems. They provide resources upon which Uganda's Tourism and hence foreign exchange is realized. Preventing deforestation and conserving forests is one of the cheapest ways of reducing greenhouse gases emissions. This can also benefit the communities in the vicinity of the forests through carbon trading in addition to conserving the ecosystem with the associated services of provision, regulation, and support among others.

### **3.4 Tourism**

Uganda has shown an impressive performance in the tourism sector with the total number of annual tourist arrivals of 1,151,000 in 2011 representing 34 percent increase from 2010. Tourists visiting wildlife protected areas increased by 9.4 percent from 190,000 in 2010 to 208,000 in 2011.

In 2012, tourism contributed USD 805 million to national economy representing 21% growth from US\$ 662 in 2010. The 2013 figures indicate that the revenue has grown to US\$ 1 billion annually. In terms of GDP, the contribution of tourism increased from 7.6 percent in 2011 to 9.2 percent in 2012 thus registering a growth rate of 1.6 percent

By 2011 tourism contributed 14.6 per cent of total employment (630,830 jobs) and the sector contributes 23 percent of the total registered businesses (hotels restaurants, recreational and personal services) in the country. Tourism continues to be a major foreign exchange earner for the country contributing US\$ 805 in 2012 becoming the second foreign exchange earner for Uganda coming only next to foreign remittances from abroad. This performance is attributed to strategic advertising in the source market, increased variety in the products, tapping of the domestic market (nationals) and attracting regional and international conferences and meetings.

The tourism industry is expected to play a major role in the economy and a major contributor to GDP by 2040. It will provide enormous employment opportunities directly and in related service industries and earn US\$ 12 billion by 2040. In addition to the direct benefits the industry will spur the growth of the associated secondary and tertiary industries

Although the sector is recognized to be one of the fastest growing service sectors of the economy and a major foreign exchange earner for the country, Government has not strategically invested and mainstreamed tourism in all Government activities to boost the sector.

The vision 2040, proposes to improve tourism support infrastructure and services to effectively facilitate the tourism industry. This will include transport networks and connectivity by improving and expanding Entebbe International Airport, up- grading five tourism aerodromes, and improving domestic air transport.

The tourism sector is to become the mainstay of the economy contributing highest in foreign exchange earnings, tax and non-tax revenue, employment and to GDP as a whole. Government plans to make Uganda one of the top five tourist destination in Africa and among the top 10 long haul tourist destination in the world. Given that Uganda's tourism is mostly biodiversity based, this is an important entry point for resource mobilization for the conservation and management of biodiversity.

### **3.5 Health**

Biodiversity is the foundation of human health including the various species of fauna and flora. It provides priceless life sustaining services that guarantee continuity of human kind. A commendable proportion of Uganda's population directly depends on natural herbs to boost immunity and health including those who use synthetic drugs which also have a strong nexus with indigenous plants.

The contribution of biodiversity to health is mainly rooted to forestry biodiversity were different tree species treat a myriad of illnesses. This explains why the herbal trade is gaining a niche in Uganda's health market and contributing to local revenue albeit most of it is done in the informal sector. A healthy population is critical in economic growth and development and since biodiversity is the basis of human health, it is unequivocally the foundation of national development and transformation.

There are various plants associated with medicinal value in Uganda including; *Moringa*, *Aloe vera*, *Prunus africana*, *African tulip* and *African tonic* among others). Recent ethno botanical research has identified more than 300 plants (trees, shrubs, flowers and weeds) growing wild across the country associated with medicinal value. Some of these crops have gained value in the pharmaceutical industry and are now grown on a commercial value while others are harvested by herbalists at a zero price.

Biodiversity plays a role in the control and regulation of infectious diseases. A number of diseases emerge from destruction of tropical forests and ecosystems. Empirical research shows that people living in deforested areas are more susceptible to malaria than those living in the vicinity of forests. Poor health has dire consequences on the economic status of individuals through reduced incomes, savings and investment. They have to spend more on healthy at the expense of savings and investment that spur economic growth. This comes with costs like loss of incomes, a fall in standards of living and trickle down effects on the education, health and livelihood of dependants of the affected party.

### 3.6 Ecosystem services

Environmental valuation is putting monetary values on environmental goods and services many of which have no observed market prices. These include: scenic views, biodiversity and mountain vistas. Other goods and services include indirect processes such as; water supply, water sheds forests and carbon sequestration, erosion control, ecosystem conservation and maintenance of genetic material. Biodiversity valuation therefore is the placing of monetary values on biodiversity resources that are derived from the different ecosystems. Compelling reasons for natural resource valuation:

- a) Valuation of biodiversity demonstrates its important and strategic contribution to economic growth and other development goals such as; foreign exchange earnings, employment, revenue generation and wealth creation among other goals;
- b) The demonstration of the economic contribution of biodiversity to meeting national developing goals and objectives can be used to make an economic case for increased budget allocation to the environmental sector and biodiversity in particular.
- c) Valuation enables the construction of natural resource accounts that help us to recognize the depreciation of natural capital in our quest for rapid economic growth and poverty reduction. Taking into account the depreciation of natural capital, gives a fair indication of economic performance.
- d) Major policies and decision affecting the lives of many people are usually based on market prices and monetary values. Through giving monetary values to biodiversity assets and ecosystem services many of which are not quantifiable and have no market prices, valuation facilitates quick judgment and rational decision making;
- e) Biodiversity values informs natural resource management policies and decisions e.g. in the determination of taxes, charges, fees, levies and subsidies on natural resources.
- f) Biodiversity is a form of natural capital resource and therefore damaging or using it is in a sense similar to the use of any other form of capital. Some parts of this capital cannot be replaced or substituted with manufactured capital. Valuation of biodiversity is thus fundamental to the notion of sustainable development.

## **PART II: IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN**

### **1. INTRODUCTION**

#### **1.1 Brief background on NBSAPs**

The legal basis for NBSAP is Article 6 of CBD which requires Parties to the Convention to develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, *inter alia*, the measures set out in CBD relevant to the Party concerned. The Article further calls upon Parties to integrate, as far as possible and appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

NBSAPs are key implementation tools of the CBD and hence help to address all its three objectives namely the conservation of biological diversity, sustainable use of the components of biological diversity and the fair and equitable sharing of benefits arising from the utilization of genetic resources. Through the NBSAP actions are identified and prioritized in order to meet the objectives of the CBD at the national level and to devise a plan on how to implement the strategies and actions Uganda developed its first NBSAP in 2002 and it is being review and updated to align it to the Strategic Plan for Biodiversity 2011-2020 and other emerging issues like climate change, oil and gas, taxonomy among others in the NBSAP.

#### **1.2 Strategic Plan for Biodiversity 2011-2020**

The Strategic Plan for Biodiversity 2011-2020 (available at [www.chm.nemaug.org](http://www.chm.nemaug.org) and [www.cbd.int](http://www.cbd.int)) was adopted by Parties to the CBD during the 10<sup>th</sup> meeting of the COP to CBD in October 2010 in Nagoya Japan. The vision of the Strategic Plan is that “By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people. The mission is to “take effective and urgent action to halt the loss of biodiversity by 2020, In order for the mission to be achieved, pressures on biodiversity have to be reduced, ecosystems have to be restored, sustainable use of biodiversity have to be promoted, benefits arising out of utilization of genetic resources have to be shared in a fair and equitable manner; adequate financial resources have to be provided, capacities are enhanced, biodiversity issues and values mainstreamed. The Strategic Plan has five strategic goals namely:

- a) Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- b) Reduce the direct pressures on biodiversity and promote sustainable use
- c) Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
- d) Enhance the benefits to all from biodiversity and ecosystem services
- e) Enhance implementation through participatory planning, knowledge management and capacity building

Each of the above strategic goals has global targets referred to as the Aichi Targets. In total there are 20 Aichi targets. COP10 urged Parties to the CBD to implement the Strategic Plan for Biodiversity 2011-2020 and in particular to develop national targets, using the Strategic Plan and its Aichi Targets, as a flexible framework, in accordance with national priorities and capacities and taking into account both the global targets and the status and trends of biological diversity in the country.

COP10 further urged Parties to review, and as appropriate update and revise, their NBSAP, in line with the Strategic Plan and to integrate their national targets into their NBSAP adopted as a policy instrument, and report thereon to the COP at its eleventh or twelfth meeting COP10 also urged Parties to:

- a) Use the revised and updated NBSAP as an effective instrument for the integration of biodiversity targets into national development and poverty reduction policies and strategies, national accounting, as appropriate, economic sectors and spatial planning processes, by Government and the private sector at all levels;
- b) Monitor and review the implementation of their NBSAP in accordance with the Strategic Plan and their national targets making use of the set of indicators developed for the Strategic Plan as a flexible framework and to report to the COP through their fifth and sixth national reports and any other means to be decided by the COP.

Uganda received financial support from the GEF through the United Nations Environment Programme (UNEP) for the review and updating of NBSAP taking into account the above COP decisions. The next sections provides information on progress made reviewing and updating the NBSAP including setting national biodiversity targets.

### **1.3 Progress in setting of national biodiversity targets**

Development of national biodiversity targets (Table 5) was done by a Thematic Working Group comprising of key stakeholders from Government Ministries, Departments and Agencies, as well as academia, research institutions and representatives of CSOs. The process begun with a capacity building workshop for the Thematic Working Groups on setting of national biodiversity targets basing on Strategic Plan for Biodiversity 2011-2020 and its Aichi targets. The Strategic Plan for the Cartagena Protocol 2011-2020 was also used for setting national targets for biotechnology and biosafety. The Thematic Working Groups were divided into four groups namely:

- a) Policy, legislation and institutional framework for biodiversity conservation in Uganda
- b) Aquatic and terrestrial biodiversity of Uganda
- c) Biodiversity and national development
- d) Status of biotechnology and biosafety in Uganda

The provisional national biodiversity targets were further refined by a national consultant and were subjected to further review through technical stakeholder’s review workshop to validate the proposed national targets. Each national biodiversity target has been assigned to a specific institution to take lead in the implementation and reporting on the progress towards achievement of the target. These institutions constitute **the biodiversity/target champions**.

The setting of the national targets by the Thematic Working Group has created ownership of the national targets and this is expected to enhance implementation and reporting on the progress towards the achievement of the Aichi targets at the national level. It was realised that more than one national target may be required to implement an Aichi target and thus some of the Aichi targets have more than one corresponding national target as summarized in the table below.

Table 5: National biodiversity targets

No	Aichi target	Corresponding national biodiversity target(s)
1.	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	By 2018, at the latest, people are aware of the values of biodiversity and the steps they can take to use it sustainably
2.	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems	By 2020, at the latest, biodiversity values have been integrated in strategies and plans for development, economic growth and wealth creation, and are being incorporated into national accounting and reporting systems, as appropriate.
3.	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions	By 2020, positive incentives for the conservation and sustainable use of biodiversity are developed and applied, taking into account national socio economic conditions.
4.	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable	1. By 2020, at the latest, Governments, the private sector and stakeholders at all levels have put in place and implemented measures to achieve

No	Aichi target	Corresponding national biodiversity target(s)
	production and consumption and have kept the impacts of use of natural resources well within safe ecological limits	<p>sustainable production and consumption within safe ecological limits</p> <p>2. By 2020, the Government with the participation of business and other relevant stakeholders at all levels has instituted measures towards the achievement of or has implemented plans for sustainable production and consumption and has limited the impacts of use of natural resources on the environment.</p>
5.	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced	<p>1. By 2020, the rate of loss of all natural habitats including forests, is at least halved and where feasible is brought close to zero, and degradation and fragmentation is significantly reduced.</p> <p>2. By 2020, restoration plans and measures are in place for all depleted species are in place</p>
6.	By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits	<p>1. By 2020, all fish and invertebrate stocks are managed and harvested sustainably, restoration plans and measures are in place for all depleted species , the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits, e.g. Nile Perch, Tilapia</p> <p>2. By 2020, all fish stocks are managed and harvested sustainably</p> <p>3. By 2020, the impacts of fisheries activities on stocks, species and</p>

No	Aichi target	Corresponding national biodiversity target(s)
		<p>ecosystems are within safe ecological limits, e.g. Nile Perch, Tilapia</p> <p>4. By 2020, the multiple anthropogenic (human) pressures on fragile ecosystems impacted by climate change are minimized so as to maintain their integrity and functioning</p>
7.	By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity	By 2020, management plans are in place for areas under to ensure sustainable biodiversity conservation
8.	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity	By 2020, the impacts from pollution on biodiversity and ecosystem health and functions are managed and minimized (all pollution parameters including BOD, CODs, PAHS, POPs, heavy metals among others)
9.	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment	By 2020 measures for control invasive alien species instituted and implemented
11.	By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider	By 2020, at least 17% of terrestrial and inland water, especially areas of particular importance for biodiversity and ecosystem services are conserved through effective and equitable ecologically representative and connected management of protected areas.

No	Aichi target	Corresponding national biodiversity target(s)
	landscapes and seascapes.	
12.	By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained	By 2020, the extinction of threatened species has been prevented and their conservation status improved
13.	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity	<ol style="list-style-type: none"> <li>1. By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other social economically and as well as culturally valuable species, is maintained and strategies have been developed and implemented for minimizing genetic erosion and safe guarding their genetic diversity</li> <li>2. By 2020, 30% of the genetic diversity of main crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge by</li> <li>3. By 2020, Indigenous and local knowledge innovations and practices associated with PGR documented, maintained or improved as appropriate, to support customary use, sustainable livelihoods, local food security and health care</li> <li>4. By 2020 at least 2 partnerships established to ensure that wild harvested plant-based products are sourced sustainably</li> </ol>

No	Aichi target	Corresponding national biodiversity target(s)
		<ul style="list-style-type: none"> <li>5. By 2020, the importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes</li>   <li>6. By 2020 network of community based PGR management initiatives established</li>   <li>7. A well established framework for implementing the Multilateral System of accessing and benefit sharing of benefits arising from access and use of PGR BY 201</li> </ul>
14.	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable	<ul style="list-style-type: none"> <li>1. Critical ecosystems identified and mapped by 2018</li> <li>2. Identified ecosystem services valued by 2017</li> <li>3. 15 % of identified degraded ecosystems restored by 2020</li> <li>4. Safeguard 30% of the ecosystems by 2020</li> <li>5. Needs of women, indigenous and vulnerable mainstreamed in the NDP by 2016/17 FY</li> </ul>

No	Aichi target	Corresponding national biodiversity target(s)
15.	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification	<ol style="list-style-type: none"> <li>1. By 2018, Biodiversity issues fully integrated into the National REDD+ program</li> <li>2. Maintain 5% of the identified National carbon sinks and storage ecosystems' integrity by 2020</li> <li>3. Restore at least 5% of the degraded CFRs and 2% of LFRs by 2020</li> <li>4. At least 15% of the communities living in biodiversity hotspots appreciate the role of biodiversity conservation in weather, climate, climate change and livelihood by 2019</li> <li>5. At least 10% of all relevant institutions have the capacity to monitor and evaluate the impacts of cc on biodiversity, ecosystems and ecosystem services by 2020</li> </ol>
16.	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation	<p>By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is acceded to by Government.</p> <p>Review of the National Environment (Access to Genetic Resources and the Fair and Equitable Sharing of Benefits) Regulations of 2005 to take into account the Nagoya Protocol by 2017</p>
17.	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective,	By December 2014 NBSAP reviewed, updated and presented for adoption by cabinet.

No	Aichi target	Corresponding national biodiversity target(s)
	participatory and updated national biodiversity strategy and action plan	By 2015 an Monitoring and Evaluation strategy for the implementation of NBSAP developed
18.	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels	By 2017 IK, TK and community participation integrated into the conservation and sustainable use of the biodiversity at all levels
19.	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied	<p>By 2020,</p> <ol style="list-style-type: none"> <li>1. Basic taxonomic information is packaged in user-friendly formats and widely disseminated, including use of school systems</li> <li>2. The importance of taxonomy is mainstreamed in key development sectors and employment of taxonomists done in lead agencies</li> <li>3. By 2018, biotech tools (molecular markers, genetic bar coding ,etc)in the identification, characterization and conservation of biodiversity developed and applied</li> <li>4. By 2018, public Awareness, Education &amp; participation in Biotech and Biosafety are enhanced</li> <li>5. Mechanisms for continuous Human</li> </ol>

No	Aichi target	Corresponding national biodiversity target(s)
		<p>and Infrastructural Resource Capacity Development, deployment and retention</p> <p>6. Promulgate legislation on Biotech and Biosafety by 2016</p> <p>7. By 2015, the Nagoya –Kuala Lumpur Supplementary Protocol on Liability and Redress under the Cartagena Protocol on Biosafety is acceded to by Government</p> <p>8. Incorporate issues on liability and redress in the draft Biotechnology and Biosafety Bill</p>
20.	<p>By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties</p>	<p>By 2014, study undertaken in respect of CBD Decision X/3 and guidelines for financing biodiversity in Uganda developed</p> <p>By 2017 financial resources for effectively implementing the NBSAP increased by at least 5% of the current level.</p>

## 2. UPDATING OF NBSAP AND MAINSTREAMING

### 2.1 Progress of updating the NBSAP

The process began in June 2012 with a capacity building workshop and is expected to end by or before end of December 2014. Financial support is from the GEF through the United Nations Environment Programme (UNEP). The first stakeholder review workshop was held in November 2013 to obtain input on the draft NBSAP2. The comments raised during the workshop are being addressed and thereafter a second stakeholder's review workshop will be held for final validation of NBSAP2. Specifically NBSAP2 will have the following additional features which are missing in the current NBSAP1:

- e) Key new and emerging issues which have taken place since the first NBSAP was prepared in 2002. Among these are: climate change, oil and gas, taxonomy, green procurement and pollution
- f) National biodiversity targets developed within the framework of the Aichi targets, the vision, goal and objectives have been aligned to the vision, mission and strategic goals of the Strategic Plan for Biodiversity 2011-2020, and also to long term national Vision 2040 and the National Development Plan ((Table 6). Thus the implementation of the strategic objectives of NBSAP2 will enhance reporting on Uganda's contribution in the implementation Strategic Plan for Biodiversity 2011-2020 and its Aichi targets as well as the national Vision 2040 and the National Development Plan.

Table 6: Linkage between objectives of NBSAP2 and the Strategic Plan for Biodiversity

No.	Strategic Objective of NBSAP2	Linkage to the Strategic Plan for Biodiversity 2011-2020 and Aichi targets
1.	To strengthen stakeholder co-ordination and frameworks for biodiversity management	Linked to strategic goal A, B, E and Aichi targets 2,4,17
2.	To facilitate research, monitoring, information management and exchange on biodiversity	Linked to Strategic Goal A, C, E and Aichi targets: 12,18,19
3.	To reduce and manage negative impacts while enhancing positive impacts on biodiversity	Linked to Strategic Goal A, B, C, D and <i>Aichi Targets 1,3, 4, 5, 6, 7, 8, 9, 11,12,13,14,15</i>
4.	To promote the sustainable use and equitable sharing of costs and benefits of biodiversity	Linked to Strategic Goal B, D, E and <i>Aichi Targets: 6, 13, 14, 16, 19</i>

No.	Strategic Objective of NBSAP2	Linkage to the Strategic Plan for Biodiversity 2011-2020 and Aichi targets
5,	To enhance awareness and education on biodiversity issues among the various stakeholders	Linked to strategic Goal A,B, C , E and <i>Aichi Targets: 1,2,3,4,12,18,19</i>

- g) Two additional strategic objectives have been developed for the second NBSAP to cater for resource mobilization and biotechnology/biosafety and these have also be linked to the Strategic Plan for Biodiversity 2011-2020 and the Aichi target as shown in the table below.

Table 7: Additional objectives in NBSAP2

No	Strategic Objective of NBSAP2	Linkage to the Strategic Plan for Biodiversity 2011-2020 and Aichi targets
1.	To promote innovative sustainable funding mechanisms	Linked to strategic goal A, E and Aichi targets 2 and 20
2.	To harness modern biotechnology for socio-economic development with adequate safety measures for human health and the environment	Linked to the Strategic Plan of the Cartagena Protocol on Biosafety 2011-2020

## 2.2 How NBSAP2 differs from NBSAP1

As indicated in the table above, NBSAP has 7 strategic objectives while NBSAP1 had five. The two additional strategic objectives were identified by the Thematic Working Group. The additional strategic objective on resources mobilization will assist Government in reporting on resource mobilization for biodiversity financing in Uganda. Guidelines and Action Plans for Financing Biodiversity Conservation in Uganda have been developed to enhance resource mobilization. This is an outcome of a study on biodiversity financing in Uganda in line with Decision X/3 and XI/4. The strategic objective on biotechnology and biosafety provides a framework for implementing the Strategic Plan for the Cartagena protocol on Biosafety 2011-2020 and other issues on biotechnology and biosafety at the national level.

NBSAP1 did not have national biodiversity targets. National targets have been developed for NBSAP2 for each of the 7 Strategic Objectives. In order to assess progress towards achievement of the national targets each target has strategies, activities and indicators. Specific national targets and strategies have been developed in NBSAP2 to address emerging threats to biodiversity which were not captured in NBSAP1 like climate change, oil and gas, green procurement among others.

To ensure that NBSAP2 promotes integration of biodiversity into the National Development Plan (NDP) and Vision 2040, the objectives and targets on ENR in the two planning documents have been mainstreamed into NBSAP so that implementation of NBSAP contributes to the achievement of the objectives and targets in the NDP and Vision 2040. In addition, revision of the NDP 2010/11 – 2014/15 is under way and issues on biodiversity is to be strengthened including support for implementation of NBSAP2 has been proposed to be included in the next NDP (2015/16 – 2018/19).

### **2.3 Key actions and outcomes since the fourth national report**

The major achievements that have taken place since the submission of the fourth national report include the following which were supported by the GEF:

- p) UNDP/GoU Project on the Conservation and Sustainable Use of the Threatened Savanna Woodland in the Kidepo Critical Landscape in North Eastern Uganda. Implementation of the project was officially launched on 11<sup>th</sup> December 2013. The objective of the project is to protect the biodiversity of the Kidepo Critical Landscape from existing and emerging threats. The expected outcomes of the project are two folds: (1) Strengthening management effectiveness of the Kidepo Critical Landscape PA systems and (2) Integrating PA Management in the Wider Landscape to reduce biodiversity loss outside protected areas. It is a four year project.
- q) Uganda received financial support from GEF through UNEP to pilot a Project on Testing the Effectiveness of Payment for Ecosystem Services (PES) through a randomized experimental design. Project implementation begun in June 2010 and will end in April 2014. The objective of the project is to testing effectiveness of PES for financing biodiversity conservation outside protected areas. The project has attracted interest from the private sector and discussion is on-going with the private sector to contribute financial resources to ensure sustainability of the PES scheme when the GEF support ends in April 2014
- r) A national Clearing House Mechanism (CHM) [www.chm.nemaug.org](http://www.chm.nemaug.org) was developed and launch on 13 December 2012, The launch and operationalization of the CHM website has been a huge milestone in promoting sharing of information on biodiversity nationally and globally. Framework for sharing information through the CHM was developed to guide stakeholder participation in sharing information through the CHM.
- s) A study on governance and valuation of protected areas was undertaken. The findings of the two studies have been used in addressing governance issue in ENR while the study on valuation of PAs has been used to illustrate the economic importance of PAs to national development and livelihood improvement.
- t) Guidelines for sustainable biofuel production has been developed and will be used to guide investors on how to comply with the regulatory requirements, especially the EIA and post EIA requirements for biofuel production in Uganda
- u) Guidelines for financing biodiversity conservation has been developed and will be used for resource mobilization for biodiversity conservation and for planning purposes by the Ministry of Finance, Planning and Economic Development and the relevant MDAs to

allocation of resources to biodiversity conservation. The guidelines were an outcome of a study that was undertaken on biodiversity financing in Uganda in line with decision X/3.

- v) Cabinet approved the National Biotechnology and Biosafety Bill 2012. The Bill is now before parliament. Wider stakeholder consultation by Parliament on the Bill is on-going. When passed by Parliament, it will provide a legal framework to regulate biotechnology and use of GMOs in the country including on liability and redress that may arise through trans-boundary movement of GMO through Uganda.
- w) Study on taxonomy capacity needs assessment was undertaken. The study shown that personnel and infrastructure capacity on taxonomy is inadequate and proposed measure to address these and other challenges on taxonomy.
- x) A study on the role of indigenous knowledge in the conservation of medical plants was undertaken in line with Article 8j of the CBD. The study has made recommendations that are being used to strengthen participation of ILCs in biodiversity conservation in Uganda.
- y) Revision of national regulations on regulations has been initiated to align it to the Nagoya Protocol on ABS. Financial support is from the GEF through UNEP.
- z) A study on Building a Foundation for Sustainable Wildlife Trade in Uganda with a focus on the review of the National Wildlife Trade Policies in Support of the Convention on International Trade in Endangered Species of Wild fauna and flora (CITES) was undertaken. The findings of the study indicate that wildlife trade has a huge potential to generate foreign exchange for Uganda and wealth creation. The findings of the study were used to inform the review of the wildlife policy on matters concerning wildlife trade in Uganda.
- aa) The Uganda Wildlife policy was revised in 2012,aligning it with other government policies that impact on wildlife, emerging issues such as oil and gas development while enhancing the contribution of the sector to national transformation.
- bb) Cabinet approved the Uganda Wildlife Training and Research Institute Bill 2013 and Uganda Wildlife Education Centre Bill 2013. Both Bills will soon be tabled in Parliament. When passed the Bills will enable Uganda Wildlife Training and Research Institute assume wildlife sector research programmes previously performed by the former Uganda Institute of Ecology. Similarly, Uganda Wildlife Education Centre Bill will scale up awareness programmes by facilitating conservation through education.
- cc) Government, through Ministry of Tourism, Wildlife and Antiquities, commenced review of the Uganda National Wildlife Act, cap. 200 in 2013. The updating of this legislation is done hand in hand with domestication of CITES and the Lusaka Agreement that will ultimately stamp out illicit trafficking of wildlife and wildlife products, illegal trade and poaching.

## 2.4 Mainstreaming biodiversity

Uganda has made significant progress in integrating biodiversity into National Development Plan and Vision 2040. Biodiversity is recognised in the NDP under ENR. ENR is one of the enabling sectors that provides a conducive environment for all other sectors to thrive like trade and tourism among others. In the NDP there is a specific objective on restoration of degraded ecosystems (wetlands, forests, water, rangelands). The strategies are to restore the forest cover by re-forestation and afforestation, involvement of the public in tree planting and to restore the wetlands, rangelands & monitor the restoration of the ecosystems by gazetting wetlands, monitor & inspect the restoration of ecosystems. On emerging issues, the NDP provides for sustainable management of oil & gas resources thru sustainable ENR assessment and to build capacity in managing related ENR challenges. These are important entry points and opportunities for biodiversity financing

Projections indicate that Uganda will graduate into a lower middle income country by 2017, progressing to an up-per middle income category by 2032 and attaining its target of USD9500 in 2040. Projections further indicate that Uganda will be a first world country in the next fifty years. To achieve this transformation the average real GDP growth rate will have to be consistent at about 8.2 per cent per annum translating into total GDP of about USD 580.5bn with a projected population of 61.3 million in 2040.

Over the Vision 2040 period efforts will be undertaken to attain a green and clean environment with no water and air pollution while conserving the flora and fauna and restoring and adding value to the ecosystems. Sustainable utilization of the ENR will be addressed in line with Uganda's commitment to the principles of the Rio Declaration on Environment and Development, the Programme for the Further Implementation of Agenda 21 and the Plan of Implementation of the World Summit on Sustainable Development (Johannesburg Declaration on Sustainable Development) among others. Uganda will take urgent measures to protect the environment and natural resources and ensure their future sustainability. Implementation of NBSAP will contribute ensuring sustainable use of biodiversity and environmental sustainability

In addition the concept of the green economy will be considered in the context of sustainable development and poverty eradication as one of the important tools available for achieving sustainable utilization of the ENR sector in Uganda. The green economy will contribute to eradicating poverty as well as sustaining economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the ecosystems.

Efforts will be made to restore and add value to the ecosystems (wetlands, forests, range lands and catchments) by undertaking re-forestation and afforestation on public land, promoting participation of the population in tree planting on both private and public land and enhancing private investment in forestry through promotion of commercial tree planting on private land and adoption of green agriculture practices. This will lead to restoration of forest cover from the current 15 per cent of the total land area to 24 percent.

### **3. IMPLEMENTATION OF NBSAP AND CBD**

#### **3.1 Financing for biodiversity conservation**

A study on financing biodiversity conservation in Uganda indicates that stakeholders in biodiversity conservation have always reported a shortfall in resources. The need for financing biodiversity was recognized in the 1990s when the NBSAP process started. The major source of funding for biodiversity conservation through the 1990s and 2000s was the US\$ 3.5 million annual allocation from the government as well as additional contributions from revenues generated by national conservation agencies and external donor support. Innovative mechanisms such as fiscal reforms, payments for ecosystem services and green markets were used minimally without a coherent long-term strategy.

Due to the inadequate resources for biodiversity conservation degradation of ecosystems have been taking place leading to biodiversity losses in the rangelands, grasslands, agro-ecosystems, forests, open water bodies, wetlands, forests and wildlife estates. Despite the resource constraints, biodiversity has continued to contribute to the country's economic development and is considered as an enabling factor for primary sectors that will transform the country to a modern economy. For example in 2011, tourism total contribution to GDP was US\$1.6 billion which accounted for the 8 percent of total GDP. Its total contribution to employment was estimated at US\$447 million which accounted to 7 percent of the employment values in the same year.

Furthermore, the actual resources released and utilized in biodiversity conservation is significantly lower than the amount indicated in the country's budget. For example in the FY 2012/13, the overall budget for the water and environment sector was \$160 million, as compared to \$212 million in the previous financial year. The Government (on-budget) allocation for Water and Environment translated into 2.8% of the total national budget. From the on-budget resources, 17.6 percent was allocated to the Environment and Natural Resources (ENR) sub-sector. Out of the approved budget of \$128.5 million, 66.1% was released by the Ministry of Finance Planning and Economic Development (MFPED) and 97.4% was absorbed. Development Partners commitments amounted to \$40 million, but only 54.9% was released in the financial period. A review of the other biodiversity related sectors including agriculture, tourism and wildlife depicts the same concerns on the allocations, releases and utilizations of the funds.

#### **3.2 Synergies with other MEAs in the implementation of NBSAP**

- a) Implementation of the NBSAP is carried out in close collaboration with other MEAs such as UNFCCC, CITES, Ramsar, Biosafety, ITPGRFA among others. The outcome has been the following:
- b) Ownership of the NBSAP review and updating process. Outline of the revised and updated NBSAP and the road map were developed with participation of National Focal Points for the MEAs stated above.
- c) Provision of information including information on climate and climate change (adaptation and mitigation) was provided by the Climate Change Unit

- d) Integration of climate change in NBSAP2. Climate change was not specifically provided for in NBSAP1 although analysis of the NBSAP1 indicated implementation of NBSAP1 contributed to adaption and mitigation of climate change.
- e) A study on the review of national wildlife trade policies in support of the Convention on International Trade in Endangered Species of wild fauna and flora (CITES) was carried out as part of enhancing synergies between biodiversity related Conventions. The study clearly shows incontrovertible evidence that there is growing interest in wildlife trade in Uganda although it is still at a minimal level. However, a number of issues need to be addressed to make wildlife trade a viable and sustainable enterprise.
- i. It is evident that a combination of human and physical factors is imposing significant pressure on the Nation's wildlife protected area system. Therefore the viability and stability of wildlife species in *in-situ* conditions is a condition precedent for a growing and sustainable wildlife trade.
  - ii. Agriculture, particularly understood as crop and animal husbandry is still seen as the key driver for the growth and transformation of the economy. There is over emphasis on conventional agriculture as compared to wildlife farming which is a fairly new and unconventional farming enterprise sub-sector. This problem is compounded by the fact that wildlife farming and trading is conducted within the realm of conservation and trade and has less interaction with the institutions responsible for agriculture. Consequently, there is need for reconfiguring the institutional framework for wildlife trade to enable more engagement with those in the agriculture sector.
  - iii. Evidence from the study already demonstrates efforts by public agencies to promote trade in wildlife life. These efforts are complete by and enthusiastic and growing private sector that is kin to take advantage of the enterprise opportunities that wildlife trade presents. While this is a positive development in macro-economic and conservation terms, increased trade in wildlife if not managed properly can have a devastating effect on the status of wildlife species in the country. Therefore wildlife trade promotion will be guided by resources sustainability as the fundamental policy objective.
  - iv. At the moment, Uganda Wildlife Authority is effectively discharging its responsibilities with respect to the regulation of wildlife trade. However, a reconfiguration of the current institutional collaboration is necessary to bring on board institutions such as the National Council for Science and Technology which has the mandate to implement the regulations on access to genetic resources and benefit sharing (ABS).
  - v. In order to ensure sustainability of the resources base and the viability of wildlife enterprise and wildlife trade, it is important that decisions be based on information regarding the status of the resource being traded or targeted for trade. A combination of regular monitoring and research will be essential in generating the data that is required for effective decision-making. The following should be done to enhance information based decision-making:

- vi. Regular collection and dissemination of data. This should cover ecological data as well as data on wildlife production system;
- vii. Development of clear monitoring indicators. These should cover, *inter alia* wildlife sustainability indicators; resource stability and productivity indicators; equity indicators measuring community benefits from and responses to wildlife conservation; and number of *in situ* and *ex situ* wildlife enterprises.

### **3.3 Key lessons learnt in the implementation of NBSAP**

- a) Awareness level on NBSAP1 was low. It was developed by consultants unlike for NBSAP2 which has had input from the Thematic Working Group that carried out the stocktaking of baseline information. Members of the group were drawn from Government ministries, departments and agencies as well as from academia, NGOs and the private sector. This approach has already created awareness across the diverse composition of the Thematic Working Group.
- b) Inadequate financial resources limited implementation of NBSAP1
- c) The review of current ABS regulations is on-going and this will provide information to be included on ABS in NBSAP2
- d) Mainstreaming biodiversity in the relevant sectors including the National Development Plan is a very useful tool for leveraging/mobilizing financial resources
- e) Mechanism for sharing information on biodiversity is critical. It contributes to creating awareness biodiversity
- f) NBSAP1 did not have costs for the activities and this affected resource mobilization

### **3.4 Some success cases in the implementation of NBSAP1**

- a) CBD Programme of Work on Protected Areas (Governance and Economic Valuation of Protected Areas)
- b) Formulation of ABS regulations
- c) Preparation of a National Invasive Species Strategy and Action Plan
- d) Successful development, launch and operationalization of a National Clearing House Mechanism
- e) A study on biodiversity financing and development of Guidelines and Action Plans for Financing Biodiversity in Uganda
- f) A study on the Role of Indigenous Knowledge and Practices in the Conservation of Medicinal Plants
- g) A study on taxonomy capacity needs assessment for Uganda
- h) Study on governance of protected areas
- i) Development of Guidelines for Sustainable Biofuel Production in Uganda
- j) Valuation of the contribution of the forest sector to national economy
- k) Inclusion of biodiversity in the National Development Plan (2010-2015) especially at ecosystem level – wetlands, forests, rangelands
- l) Continuous engagement of Ministry of Finance in Mobilization of Resources for Financing Biodiversity

### **3.5 Challenges in the implementation of NBSAP**

- (i) Balancing biodiversity conservation and oil exploration activities in the biodiversity rich areas in the Albertine Graben
- (ii) High rate of population growth is resulting into more demand for land for growing food and other cash crops. Fragile ecosystems such as wetlands, highly and mountainous areas are increasing being degraded resulting into flooding, siltation of water bodies and land slides
- (iii) Securing sustainable and predictable biodiversity financing
- (iv) Carrying out a comprehensive inventory of the biodiversity resources – including terrestrial, aquatic and below ground biodiversity.
- (v) Creating adequate public awareness and education on biodiversity and sustainable use of biological resources;
- (vi) Managing biodiversity outside protected areas. Biodiversity loss in Uganda is greatest outside protected areas;

### **3.5 Opportunities for implementation of NBSAP**

- c) Discovery of oil and gas in the Albertine Graben. Funds generated to be used to fund other sectors such as ENR
- d) Biodiversity has been included in Vision 2040 and in the NDP. This is an entry point for resources mobilization
- e) Review of NDP1 provides opportunity for strengthening biodiversity issues in NDP
- f) The Resource Mobilization for Biodiversity is Ministry of Finance, Planning and Economic Development. This is an import entry point for lobbying for increase in financing for biodiversity
- g) Development of Guidelines and Action Plans for Financing Biodiversity in Uganda is an important planning tool for resource mobilization

### **3.6 Recommendations to enhance implementation of NBSAP**

- (i) Support for strengthening institutional and human capacity for effective implementation of Aichi targets at the national level
- (ii) Mobilization of financial resources at the national level, from development partners and the GEF to support implementation of NBSAP2, the Aichi targets at the national level
- (iii) Engaging the private sector especially the oil companies to support biodiversity conservation and management
- (iv) Developing and implementing a communication, education and awareness strategy at all levels of society
- (v) Restoration of degraded ecosystems that provide vital ecosystem services to the local communities and sustains national development programmes

## **PART III: PROGRESS TOWARDS THE AICHI TARGETS AND MDG TARGETS**

### **1. MDGs targets related to biodiversity**

The Millennium Development Goals (MDGs) are eight international development goals that were officially established following the Millennium Summit of the United Nations in 2000, following the adoption of the United Nations Millennium Declaration. All 193 United Nations member states and at least 23 international organizations have agreed to achieve these goals by the year 2015. The goals are:

1. Eradicating extreme poverty and hunger,
2. Achieving universal primary education,
3. Promoting gender equality and empowering women,
4. Reducing child mortality rates,
5. Improving maternal health,
6. Combating HIV/AIDS, malaria, and other diseases,
7. Ensuring environmental sustainability, and
8. Developing a global partnership.

The aim of the MDGs is to encourage development by improving social and economic conditions in the world's poorest countries. Each of the goals has specific stated targets and dates for achieving those targets. With regard to goal 7 on ensuring environmental sustainability, there are two targets that are relevant for biodiversity namely:

- a) **Target 7A:** Integrate the principles of sustainable development into country policies and programs; reverse loss of environmental resources
- b) **Target 7B:** Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss.

Target 7A: Integrate the principles of sustainable development into country policies and programs; reverse loss of environmental resources.

Uganda has made tremendous progress in integrating the principles of sustainable development into country policies and programmes. The NDP 2010/11 -2014/15) which is the country's mid-term planning framework devotes a full chapters to Environment, Forestry, Climate Change, Wetland Management and the Meteorology sector. The Plan classifies Forestry among the Primary sectors of the economy while the rest are deemed as enabling sectors of the economy. Uganda is thus registering high progress on Target 7A because having these sectors in national documents that influences the budgeting process and other economic decisions demonstrates that sustainable development is at the heart of policy makers.

Besides the NDP, Uganda has a long term National Vision that will be operationalized through six 5 year development plans. The 30 year plan equally dedicates a full chapter to the Environment sector and gives a succinct text on Uganda's aspirations and what the Government will do to promote environment sustainability over the vision period. One of the areas mentioned

is biodiversity loss and the Government commits to address factors that spur biodiversity loss in the 30 year period. The Government has also made leaps in specific policies, laws, institutions, regulations and standards to guide the management of natural resources. The National Environment Management Policy (1994) and the NBSAP are under review while the climate change policy is in its final stages.

Progress on the second part of 7A (reverse loss of environmental resources) is still slow. The National Development Plan (2010/11 – 2014/15) notes that forest cover in Uganda has been declining and NEMA (2011) reports an annual decline of 1.86% in the last decade. For instance total forest cover declined from 24% in 1990 to 18% in 2005. The forest cover further reduced to 15% in 2010 (Uganda Vision 2040). The loss mainly emanates from rapid conversion of forest land to other uses in response to a high population growth and reliance on fuel wood and charcoal for cooking energy (98% of the population). Government considers rural electrification as one of the strategies to reduce forestry loss and restore the 1990 level. The NDP mid-term review report however reveals that this strategy has been undermined by poor institutional coordination since forestry and rural electrification are mandates of totally different ministries. Nevertheless, Uganda is making progress in adopting renewable energy inform of energy efficient stoves and briquettes, the Government move to cut tax on solar equipment is also a step in the right direction.

**Target 7B:** Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss.

Uganda's 2010 MDG progress report shows that there is still low progress on attaining the target of reducing biodiversity loss because of a number of constraints. The report highlights that poverty and a rapid population growth are the primary causes of biodiversity loss, threatening the existence of species, ecosystems and eco-regions throughout Uganda. A study carried out by NEMA in 2011 shows that the rate of biodiversity loss is accelerating and there clear indications that depletion of natural resources is still a big problem in Uganda. For instance, the share of land covered by forest declined from 25% in 1990 to 18% in 2006. Fish species are also deteriorating at an alarming rate as evidenced by the fall in catches over the years. There is thus need for pragmatic intervention to reverse this falling trend.

Besides forestry, biodiversity loss has stretched to wetlands ecosystems. By 1999, wetlands covered about 13 percent of the total area Preliminary data from the National Biomass Study Unit of the NFA revealed that this coverage had been reduced to 11 percent of the total land area by 2008. Today, wetland coverage is estimated at a mere 10.9 percent of total land area down from 16 percent in 1994 representing a 7.4 percent decline. In real terms, 30 percent of Uganda's wetland ecosystem representing 4.7 percent of Uganda land area has been lost in just 15 years. This debacle performance is attributed to massive rice cultivation, urbanization, rapid population growth, industrialization and low compliance to environmental laws which is partly driven by political interference. Birds and fish species continue to decline in number across the country.

## **1.1 Progress in implementing the Strategic Plan for Biodiversity, the Aichi and national targets**

In decision X/2 para 3(e) Parties to CBD were urged to monitor and review the implementation of their NBSAPs in accordance with the Strategic Plan for Biodiversity 2011-2020 and their national targets making use of the set of indicators developed for the Strategic Plan as a flexible framework and to report to the Conference of the Parties through their fifth and sixth national reports and any other means to be decided by the Conference of the Parties. Uganda has aligned its NBSAP2 to the five goals of Strategic Plan for Biodiversity 2011-2020 and also developed national biodiversity targets within the framework of the Aichi targets.

Implementation of the national biodiversity targets is linked to implementation of the Aichi targets since the national biodiversity targets were developed within the framework of the Aichi target as a flexible framework. National targets have been set within the framework of the Aichi targets. Progress has made in the national with significant progress in target 1, 2, 3,4,5,6,7,8,9, 11, 12, 15, 16, 17, 18, 19, and 20. These have been as a result of concerted effort by stakeholders and also the fact that there are on-going activities and programmes that contribute to the realization of these targets. The overall progress of implementation of the Aichi target is summarized in the table below in the Annex1. Case studies on the implementation of the Aichi targets at the national level are presented below.

**Case study on Aichi target 1:** By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. This target falls under Strategic goal A of the Strategic Plan for Biodiversity 2011-2020 which aims at addressing the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society. The corresponding national target is that by 2018, at the latest, people are aware of the values of biodiversity and the steps they can take to use it sustainably.

The review process of NBSAP1 revealed low levels of awareness of the NBSAP document itself and low levels of understanding of the term biodiversity. This holds true both for key decision makers and those responsible for the day-to-day management of natural resources. For this reason the major activity is to develop and implement a comprehensive and proactive Communication, Education and Public Awareness (CEPA) Strategy that reaches target sectors, local communities and the general public and facilitates the conservation and sustainable use of biodiversity.

Education has been a vital tool in promoting conservation and understanding the linkage between society and economy. In line with the UN Decade of Education for Sustainable Development, Uganda has an Education for Sustainable Development Implementation Strategy (2010) which anchors sustainability into all programmes and educational activities. Education is also key to achieving sustainable development including biodiversity conservation. In the fifth NBSAP, education is to be strengthened to make more people aware and engaged in the implementation. This will also contribute to improved coordination in the implementation process.

The key tertiary institutions like National Teachers' Colleges, vocational/technical institutions and universities have developed both academic and non academic (community outreach programs) through education for Sustainable Development Strategy (ESD) in the Regional Centres of Excellence (RCEs) established in the key public universities in Uganda. This was supported by United Nations Educational, Scientific and Cultural Organization (UNESCO).

For knowledge on biodiversity to be effective, people need to understand the processes, acquire the necessary skills and values with which to sustainably manage the resources. Meeting livelihood needs is the biggest challenge to communities and they need to understand that meeting basic needs can co-exist with conservation of ecosystems. Concepts like ecosystem services are not appreciated and valued. This will go a long way in curbing unsustainable practices like poaching, cutting endangered species like shea butter trees, *prunus Africana* and draining wetlands.

Education programmes on biodiversity range from curriculum integration at all levels of formal education to the non-formal programmes and informal activities. Biodiversity is integrated in the Primary, Secondary curriculum and relevant University faculties and Colleges. There are also residential field nature experiences for school children offered at the visitor centres like Mt Elgon Exploration Centre – Kapkwai, the Uganda Wildlife Education Centre in Entebbe, Environmental Education Centres around protected areas. School clubs like Wildlife Clubs of Uganda, environment clubs engage learners in conservation activities, projects and field visits. This has shown that young people who are engaged in environmental clubs perform better and continue with the work even in adult life. Annual camps for children and teachers are organized for schools around parks. The teaching needs to develop a deeper understanding of biodiversity beyond the extra-curricula activities.

Other non formal education programmes target communities living around wetlands and protected areas like national parks and forest reserves. Many NGOs and CBOs are involved in promoting conservation education in different parts of the country. Special programmes like bush meat educational campaign in sub counties surrounding the national parks are there to control poaching and involve communities in carrying out alternative livelihood activities.

Public education is continuously carried through exhibitions during International days celebration like World Environment Day, Biodiversity Day, Tourism Day, Wetlands Day, Forestry Day and others. Both the print and electronic media provide information on different aspects of biodiversity. Television documentaries like Eco Talk and Friends of Botany raise awareness on and provide information on biodiversity regularly to the public. Various organizations have produced information, education and communication materials on different themes such biodiversity ecosystem services, proper use of wetlands. Outreach programmes also target communities during special events such agricultural shows, tourism expo.

Various Non- governmental organizations provide localized and specific education programmes in areas where species and habitats are threatened for example the mountain gorilla conservation is being spearheaded by Conservation Through Public Health (CTPH) and the Gorilla Organisation in Bwindi Mugahinga National Park. The Jane Goodal Institute (JGI) and the CWST champion the conservation of Chimpanzees in various locations

The biggest challenge in promoting biodiversity education is insufficient funds to reach the diverse resource users , emerging negative practices and locations. Education is a lifelong process and therefore requires a protracted engagement for people to understand and change their attitude and behaviour. Scaling up best practices requires funding and improved networking.

Another challenge is coordination of the diverse stakeholders, initiatives and development activities . There are best practices that are not known and yet could be replicated like Population Health and Environment (PHE) initiative by CTPH in Bwindi that has saved the lives of mountain gorillas from zoonotic diseases and provided alternative livelihood and better sanitation and family planning. Many projects pay lip service to education and assume a one off workshop is sufficient. For an education programme to be effective, it has to be planned and engage the stakeholders in using various techniques and made part of the process.

The following are vital in enhance awareness on biodiversity:

- a) Education for sustainable development should be mainstreamed in all biodiversity programmes and projects to enable people understand the human dependence on biodiversity and to help them make right choices. Education must not be a stand-alone activity but used to unlock people's mindset to enable them sustainably manage the resources.
- b) More stakeholders need to be engaged and empowered to reorient their programmes to include education for sustainable development. Few agencies understand the concept and practices. There is need to addresses biodiversity, society and economy in a holistic manner.
- c) Coordination of the implementation of the NBSAP needs to be strengthened. The national Clearing House Mechanism (CHM) launched on 13<sup>th</sup> December 2012 is one example of strengthening and increasing information sharing about biodiversity but majority of the people do not have access to internet. Coordination should be enhanced at both the local and national levels. Linkages, partnerships and synergies would enhance better understanding.
- d) Biodiversity education outside protected areas needs to be targeted and prioritised especially farmers. Efforts to conserve shea butter trees should begin with a distinct education programme to make people understand the value of preserving the trees to sustain them for generations than make charcoal that meets the need for one day.
- e) There are CBOs that deal in medicinal plants that should engage in educating the public on conservation of such plants. Communities need to be innovative and made to appreciate alternative livelihoods such conservation agriculture and ecotourism that conserve the resources while providing a better standard of living.

- f) There is need to build the capacity of the communities to be better engaged in monitoring biodiversity outside protected areas in light of the new emerging developments like oil and gas exploration, invasive species, high population growth, and climate change. In light of the high school drop-out rate most of whom resort to harvesting biodiversity unsustainably should be targeted and efforts made to implement the Pan- African Youth Strategy on Learning for Sustainability.

**Case study on Aichi target 2:** By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems. This target also falls under Strategic goal A of the Strategic Plan for Biodiversity. At the national level corresponding national target is “By 2020, at the latest, biodiversity values have been integrated in strategies and plans for development, economic growth and wealth creation, and are being incorporated into national accounting and reporting systems, as appropriate”.

In Uganda, the annual contribution of ecosystem services is estimated to have decreased from US\$ 5,097 million in 2005 to US\$ 4,405 million in 2010. This decline has mainly been due to deforestation which has affected the resilience of the ecosystem and consequently the quality of goods and services accruing from the affected ecosystems. Protected areas play a critical role in provision of ecosystem services for livelihood improvement and national development. However the statistical value has not yet been captured in national accounting. Capturing the economic values of PAs will contribute to the incorporation of the roles of PAs into the national accounting system and improving understanding on their importance of PAs in poverty reduction and national development.

An initial analysis of the progress of implementation CBD POWPA was carried out in 2008 and from the analysis it was found out that Uganda has put in place the necessary policies, programmes and activities to enhance implementation of the goals, targets and activities of CBD POWPA. Stakeholders identified two areas that needed specific studies namely valuation and governance of protected areas. Uganda received support from GEF to carry out the two studies and the reports of the two studies. Basing on this recommendation a study on the valuation of PAs focusing on Murchison Falls Conservation Area (MFCA) and Budongo Central Forest Reserve (BCFR) was undertaken. This study was undertaken concurrently with a study on governance of PAs.

From the valuation studies of the protected areas two protected areas above, it shown that the returns from ecosystems services overshadow stock harvesting. Both PAs do not only conserve the biodiversity but annually contributes ecosystem services in:- non-timber products, mainly wood (US\$1.92 million), non-wood forest products (US\$ 2.17 million), medicinal and pharmaceutical (US\$ 0.88million), soil erosion control (US\$ 52.8million), carbon sequestration (US\$ 1.5 million), watershed protection and catchment services (US\$10.6 million), research and education (US\$0.02 million) and aesthetic (US\$ 56.92 millions).

The bequest and existence value of the ecosystem and the relocation and rehabilitation costs if the protection area were to be started in 2009 would have been above US\$ 14 and 46 billion respectively. The protected areas were also observed to be important sources of food, construction materials, firewood, water and religious and cultural services that although could not be directly allocated value, were critical in poverty reduction among the community living adjacent to the protected areas.

Another study was carried out on the contribution of forest sub-sector to the national economy with focus on the economic value of Uganda's forest resources. The revealed that the forest sub-sector contributes 8.7% to Uganda's GDP basing on the national accounts figures for 2010. The contribution of forestry to the national economy is estimated at US\$1,277 million. In order to have a bigger picture on the economic contribution of natural resources to the economy, the study has recommended similar studies for wetlands, soils, land and fisheries among others. The study also recommended development of capacity in natural resource accounting methodology to generate data that can be used for resource accounting.

The studies on valuation natural resources has contributed information that will be used to guide discussion on greening of the national economy and contribution to implementation of the Rio+20 outcome on the future we want. The study pointed out key conservation messages which include enhancing soil protection services of forests, REED+, enhancing hydrological services, biodiversity conservation especially in relation to recreational services and protection of important. The study recognized new innovative financial mechanisms like PES and REDD which can enhance conservation while also contributing to economic development. In order to increase the contribution of the PA to both poverty reduction and the provision of ecosystems services, the study recommended the following:

- a) Undertaking of regular scientific inventories of the PAs to identify, quantify and document all key resources in the area;
- b) Updating of valuation studies of key ecosystem goods and services and assessing the cost/benefit implications of maintaining them;
- c) Promoting the multiple use of strategies including community access to protected area resources on a sustainable basis;
- d) Introduction of support of more meaningful revenue and benefit sharing schemes; development and support of new wildlife based local enterprises and supply chains (beeswax, medicinal extracts, wild plant foods etc);
- e) Development and implementation of relevant and effective economic instruments for the conservation of protected areas;
- f) Creating opportunities for REDD+ projects and programmes that incorporates both the maintenance of PAs and improvement of local communities livelihoods should be explored; and
- g) Ensuring that more capacity needs to be built on the valuation of protected natural resources and ecosystem services especially for natural resource managers in Government ministries, Government departments/agencies, NGOs and the private sector.

**Case study on Aichi Target 3** under Strategic Goal A stated that “By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions”. The corresponding national target is “By 2020, positive incentives for the conservation and sustainable use of biodiversity are developed and applied, taking into account national socio economic conditions”.

The National Environment Management Authority (NEMA) in collaboration with the Chimpanzee Conservation and Wildlife Trust (CSWCT) is on behalf of Government implementing a project on Payment for Ecosystem/Environmental Services (PES) to enhance conservation of biodiversity in the Productive Landscapes in Uganda. It is a four year project supported by the Global Environment Facility (GEF) through the United Nations Environment Programme (UNEP).

The following organizations are involved in the project are carrying out specific tasks: International Institute for Environment and Development, Innovations for Poverty Action (IPA), Nature Harness Initiative (NAHI) and the Stanford University. The project aims to use a payment scheme to create incentives for local communities in Hoima and Kibaale districts to conserve and restore private forests important for chimpanzees as well as other components of biodiversity and in this way deliver environmental and social benefits. The private forests in Hoima and kibaale districts are habitat for wildlife (chimpanzee) and also water catchment for Lake Albert which feeds R. Nile.

The forests on private land in Hoima and Kibaale provide ecosystem services that have both national and global significance but are under threat due to conversion to agricultural production especially rice, maize and tobacco growing. The scheme focuses on patches of forest on private land forming a corridor between Budongo Forest Reserve and Toro-Semliki Wildlife Reserve. This corridor is home to some of Uganda’s largest chimpanzee populations living outside protected areas. The chimpanzee is a globally endangered species. Clearing of forests for cash crops such as tobacco and rice in this area is threatening the survival of these chimpanzee populations.

The loss of these forest habitats is also threatening other ecosystem services such as watershed services, climate regulation through carbon storage, clean water, control of soil erosion and siltation of rivers and streams. Very important to note is the fact adequate forest cover is needed to sequester the carbon that will arise from oil production activities in the Albertine Graben as well as well enhance ecosystem resilience for ecosystem based adaptation (EBA) to addressing the risks to climate change.

The goal of the project is Enhancement of Biodiversity Conservation in Production Landscapes in Uganda and globally through better understanding of Payment for Ecosystem Services while its objective is to test the effectiveness of PES as a viable means for financing and procuring biodiversity conservation outside protected areas in Uganda using an experimental methodology. The project has four components:

Implementation of the PES scheme begun in July 2011 and the project has been able to engage 342 PFOs who are the beneficiaries of the PES scheme. The scheme provides an annual payment of USD 35/ha in exchange to regulated forest use and halting deforestation. Up to 1590 ha of forest is to be restored through the PES scheme with the 342 PFOs as summarized below.

Total PFOs in the study sample	1275
Treatment villages	70
Comparison villages	70
Total PFOs participating in the PES scheme	342
Total ha under contract by PFOs (in the treatment villages)	1590

Providing incentives to PFOs is proving a success in halting further loss of forests on private land. However the project is encountering some challenges and key among these is the sustainability of the project beyond April 2014 when the GEF funding ends, logistics for project management and up-scaling the PES scheme to other PFOs. Deforestation in Uganda is greatest outside protected areas and this project is demonstrating that provision of incentives to PFOs is critical in addressing the problem.

The 342 PFOs have signed MOU to participate in the PES. The MoU spells out the obligations of PFOs and that of CSWCT (on behalf of NEMA). The obligation of PFOs includes regulated harvesting of forest resources, enrichment planting, re-forestation among others. PFOs are provided seedlings for restoration (44,000 seedlings have been distributed and cash payment of \$35/ha/year. The PES Scheme is running in eight sub-counties namely Kyabigambire, Kitoba, Bugambe, Kiziramfumbi, Kabwoya, Kiryanga, Kakindo and Birembo as shown on the map below.

Sustainability of the project is a big challenge and a risk to the success the project is making. PFOs may revert back to business as usual scenario by going back to cutting down the forests and converting the land to agricultural production. Funds are thus needed to take this project beyond the GEF support.

**Case study on Aichi Target 8** under Strategic Goal B on reducing the direct pressures on biodiversity and promote sustainable use states that “By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity”. In line with this global target, the national target for Uganda is that “by 2020, the impacts from pollution and waste on biodiversity, ecosystem health and functions are managed and minimized’.

Pollution was reported as one of the threats on freshwater ecosystems in the fourth national report. Review of Ministerial Policy Statements of the Ministry of Water and Environment for the last 5 Financial Years points out deteriorating water quality as a major concern in Uganda. National Water Resources Assessment (NWRA) was undertaken between 2009 and 2012 and the key findings were:

1. Eutrophication (nutrient enrichment) of surface waters evidenced by increased chlorophyll a concentrations of >150ug/l in lakes and increased phosphate to nitrates ratios (P:N) of >1.0 in lakes and rivers.
2. The total pollution load in tons/year for Biological Oxygen Demand (BOD), Total Nitrogen (TN) and Total Phosphorus (TP) respectively was estimated at 24,364, 89,727 and 23,608.
3. Pollution from industries, mines and agriculture was not considered to be a major problem because these sectors are still a small part of the economy. However most industrial wastes in Uganda are discharged from the Kampala industrial area into Murchison Bay on the shores of Lake Victoria.

Pollution assessment carried out in the Inner Murchison Bay which is 8 km east of Kampala, the capital city of Uganda. Located north of Lake Victoria the bay is one of the ‘hot spots’ that has been receiving municipal/industrial wastewater, urban wastes and run-off from Kampala city for over 40 years now. It’s the same Bay that provides raw water for the Urban water supply to Kampala City and surrounding The bay is also the hub for navigation through Port-bell where Ferries connect Uganda to and fro East Africa. Many economic activities including fisheries, navigation, hotels/tourism and recreation are supported by the bay.

The Nakivubo, Kansanga, Kinawataka, Kirinya wetlands and others that used to function as filters/sinks to wastewater and flood stabilization has since been seriously encroached. The Inner Murchison bay is now the sink and source of pollution to the outer lake. Observed scenario include eutrophication, invasion by water hyacinth, fish kills, anaerobic conditions, smelly and unattractive conditions for investment. The lake water quality has extremely deteriorated over the years thus limiting its use for various needs. The deteriorating lake water quality now poses threat to public and ecosystem health and demands modifications in water treatment to more advanced water treatment methods which are very costly.

The pollution and its tertiary and quaternary effects including algal blooms have caused concern to local communities, decision makers, water resource managers, local authorities, investors, policy makers, as well as National Water and Sewerage Cooperation (NWSC), the authority that supplies treated water and treat municipal wastewater in Uganda. A rapid assessment of the pollution loads into the Inner Murchison Bay undertaken from the catchment in 2012 by the Department of Water Quality Management indicates more

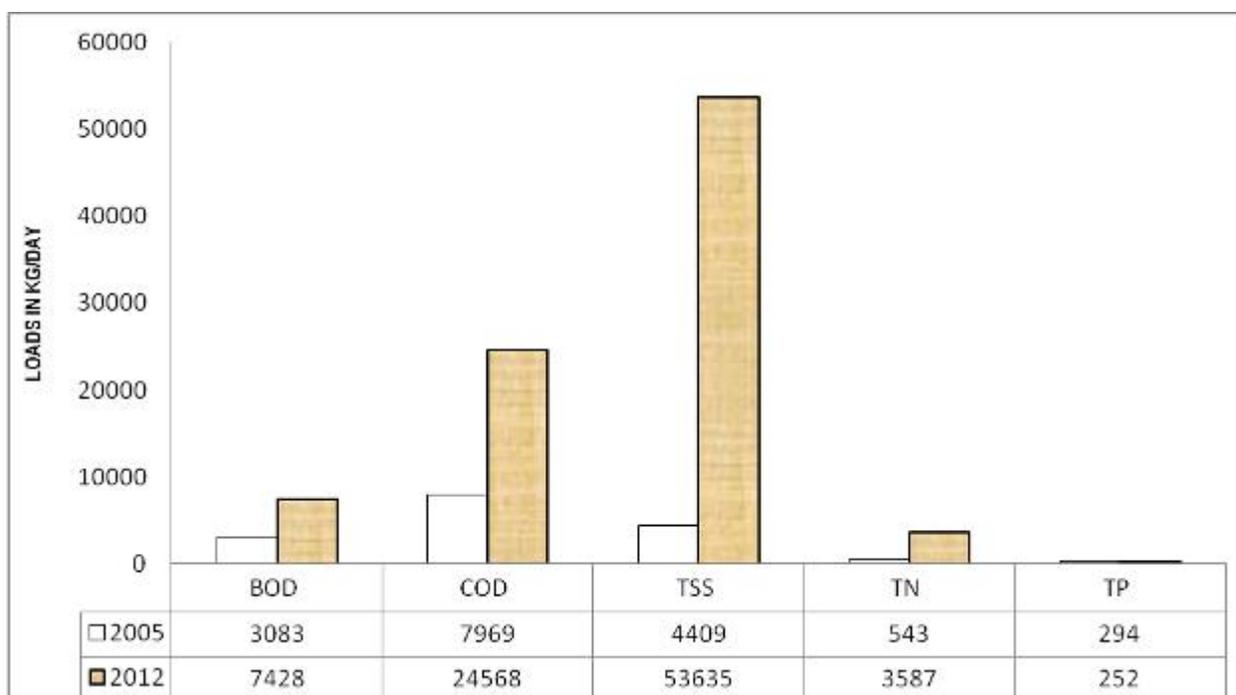
than double pollution loads (kg/d) of BOD, COD, TSS and TN except TN that remained unchanged. Table and Figure 8 below presents a comparison of total pollution loads into the bay.

Table 8: Total population loads to Inner Murchison Bay in Kampala

Loads (Kg/d)	2005	2012	%
Total Suspended Solids (TSS)	4409	13833	68%
Biological Oxygen Demand (BOD)	3083	2456	-26%
Chemical Oxygen Demand (COD)	7969	10885	27%
Total Nitrogen (TN)	543	1211	55%
Total Phosphorus (TP)	294	90	-226%

(Source: DWRM File Records 2013)

Figure 20: Total pollution loads into Inner Murchison in Kampala



(Source: WQMD 2013)

Analysis of micro-invertebrates and water quality showed complete absence of the two most important class of the macro-invertebrates (Ephemeroptera and Trichoptera), a strong indication of heavy pollution being received in Murchison Bay.

Assess of water quality was also carried out in the Albertine Graben a biodiversity hot spot in Uganda. Oil exploration is taking place in the area and thus there is need to have baseline information on water quality to form the basis for monitoring the impacts of oil production on aquatic biodiversity. Oil production is expected to start in 2018. Biological assessment using living organisms (macro-benthos) in water as indicators of the health of an environment or ecosystem was done mainly of water from rivers and streams. These organisms include any

biological families/species or group of species whose existence or absence, population, or status can be used to determine the ecosystem or environmental integrity. Their use as indicators is based on the fact that some are more sensitive/less tolerant to pollution and hence will disappear in the water when the water bodies become polluted. Some are however tolerant to pollution and will continue to increase in numbers when pollution of the water bodies occurs. The use of biological indicators is intended to supplement the traditional physical – chemical and biochemical tests used in water quality management and constitute or strengthen integrated water quality monitoring.

A number of rivers and streams were assessed for the presence of these macro-benthos and different families were found to be present in these water bodies. Of great interest to the study were the more sensitive/less tolerant families that will be used to monitor impact of oil and gas activities in the Graben. Table 9 presents the most sensitive macro-benthos that were found in the Graben water resources. The status of surface water quality (rivers and lakes) in the region was good considering physical and chemical characteristics. The groundwater in most places was good except along river Nile where there was evidence of high mineral salts (Electrical Conductivity) observed especially in deep boreholes.

Table 9: Sensitive macro-benthic organisms in Albertine Region

SN	Family name	Picture	Remarks
1	Perlidae		Among the most sensitive families and was found in all the rivers and streams that were assessed
2	Oligoneuridae		Family so far observed in the region only. It has been observed in Central region. Less tolerant
3	Heptageniidae		Among the most sensitive families and was found in all the rivers and streams that were assessed
4	Tricorythidae		Very sensitive ephemeroptera found in most rivers/streams in the Graben.
5	Elmidae		Water beetle larvae that was wide spread in the Graben and also sensitive
6	Potamonautidae		A crab that is widely spread in the Country and indicates good water quality
7	Simuliidae		Not widely distributed, but indicates moderate to good water quality. Likes fast flowing rivers/streams
8	Caenidae		Widely spread in the region and indicated moderate to good water quality
9	Calopterygidae		Found in most rivers/streams and indicative of moderate to good water quality
10	Gerridae		A mature water bug, indicative of moderate to good water quality

(Source: MWE 2013)

The quality of water resources in the Albertine Graben, where oil and gas activities are taking place, is good and needs to be maintained that way. Government will therefore take measures to guard against contamination of water resources by these activities. The following measures are to be implemented to improve reduce pollution of water resources in Uganda:

Capacity building at all levels in addition to awareness raising

- a) The protection of wetlands, lake shores and river banks as filters/purifiers of wastewater and storm water is crucial, and should be enforced
- b) Applied research and innovation into impact of pollution on health and ways of low cost investments is required
- c) Adoption of cleaner production measures and good practices by industries to minimize waste generation is recommended.
- d) Improving human and equipment capacity, setting water quality objectives, review wastewater effluent discharge standards and formulation of emissions standards
- e) Rolling out of biological monitoring as a good indicator of water quality in the country
- f) Capacity building at all levels in addition to awareness raising

**Case study on Aichi target 9:** By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment under goal B of the Strategic Plan for Biodiversity which aims at reducing the direct pressures on biodiversity and promote sustainable use. The national target is “By 2020, invasive species and pathways are identified, prioritized, priority species are controlled and measures are in place to manage pathways to prevent their introduction/ re-introduction”.

Invasive alien species (IAS) are the second greatest cause of biodiversity loss on earth; only habitat destruction poses a greater threat. In Uganda, the water hyacinth (*Eichhornia crassipes*) had a profound impact on the socio-economic development of Uganda in terms of curtailment of water transport, reduction of hydropower output, interference with urban water supply and reduction in fish production from Lake Victoria in the 1990’s. The cost of controlling and managing water hyacinth was estimated to be millions of dollars.

The current and potential impact of IAS and the barriers constraining IAS management in Africa has been the motivation behind the development of the Global Environment Facility (GEF) funded project, *Removing Barriers to Invasive Plant Management in Africa*. The participating countries are Ethiopia, Ghana, Uganda and Zambia, with project coordination being undertaken by CAB International and IUCN. NARO implemented the project on behalf of Government. The objective of the project was to Remove Barriers to Effective Invasive Plant Management. It stems from Decision VII/13.

The project had two pilot sites (Figure 21) to draw lessons and good practices for management of IAS with focus on *Cymbopogon nardus* in Lake Mburo Mbarara district and *Senna spectabilis* in Budong CFR in Masindi district. The project had four components:

- a) Strengthening the enabling policy and institutional environment for cross-sectoral prevention and management of IAS

- b) Utilisation of appropriate information on risks, impacts and management of IAS by key stakeholder groups and raising awareness levels
- c) Implementation of strategies for the prevention and management of priority IAS
- d) Capacity building for prevention and management of IAS

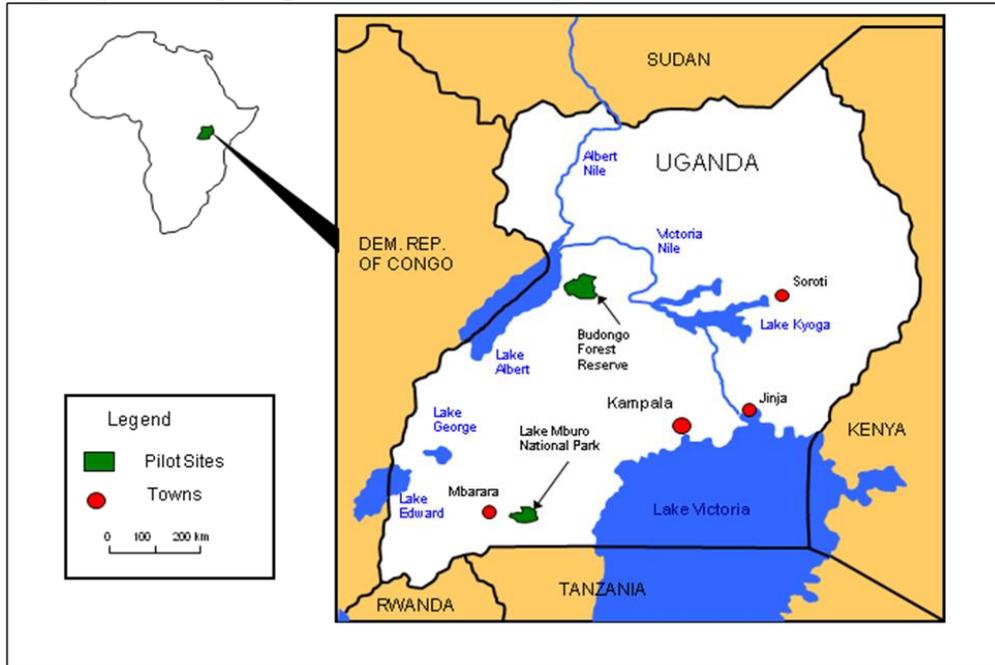
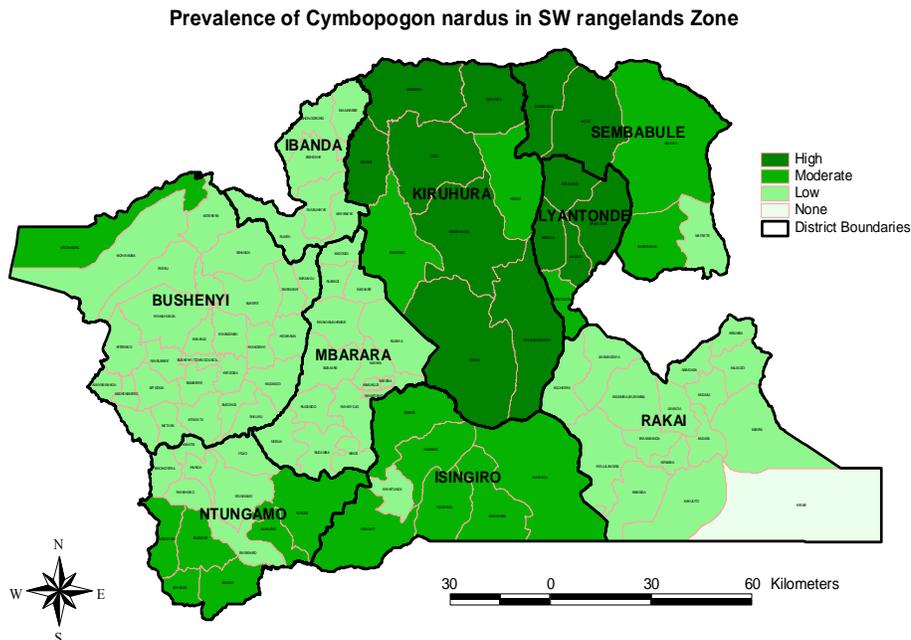


Figure 21 (above): The pilot sites for the IAS project and below Figure 22 prevalence of *Cymbopogon nardus* in South Western Uganda



The major outcome of the project is the development of a National Invasive Species Strategy, Action Plan (NISSAP) developed from lessons learnt during the implementation of the project. The goal of the NISSAP is to minimize the impact of invasive species on aquatic and terrestrial ecosystems in Uganda for improved livelihoods, poverty reduction and sustainable economic growth. The purpose of the NISSAP is to guide decision making during national and sectoral planning by Government and other stakeholders to give effect to Article 8(h) of the Convention on Biological Diversity, which states that each Contracting Party shall, as far as possible and as appropriate prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.

The objectives of the NISSAP are to:

- a) Increase awareness about invasive species as a major issue affecting Uganda's socio-economic development;
- b) Introduce strategies to prevent the introduction of IAS as a priority issue requiring national action;
- c) Ensure that intentional introductions, including those for biological control purposes, are properly evaluated in advance, with full regard to their potential impacts on the environment and economic development;
- d) Develop and implement eradication and control programmes for invasive species;
- e) Facilitate necessary research and introduce communication strategies to enhance Uganda's knowledge base in order to address the problem of invasive species; and
- f) Development of a comprehensive framework for national legislation and international cooperation for IAS management.

The NISSAP contains an institutional framework for its implementation including a coordinating mechanism and the roles and responsibilities of the various stakeholders including Government ministries and agencies, local district governments, local communities, NGOs and the private sector. Mainstreaming invasive species issues in national planning, policy and legal frameworks is seen as a sure way to access resources to support invasive species management on a sustainable basis. The review and updating of NBSAP has strengthened management of IAS by setting national targets in line with Aichi target 9.

The Technical Committee on Biodiversity Conservation established by the National Environment Act is be responsible for coordination the implementation of NISSAP while the responsible institution implement, monitor and report on progress of management of IAS within their jurisdiction.

The NISSAP has four strategic interventions for minimizing the impact of invasive species on ecosystems and habitats fall under four major categories, namely: prevention of the introduction of invasive species; early detection and rapid response including eradication where possible; control and management of invasive species and rehabilitation of areas degraded by invasive species.

The guiding principles for prevention of introduction of IAS into Uganda are:

- a) Since the impact of many invasive species on biological diversity is unpredictable, any effort to prevent unintentional introductions should be based on the precautionary principle;
- b) unless there is a reasonable likelihood that an introduction will be harmless, it should be treated as likely to be harmful;
- c) Under intentional introductions, a regulatory response to the introduction should be based on the principle that “the polluter pays” where “pollution” represents the damage to native biological diversity;
- d) Every effort should be made to minimize the risk of unintentional introductions;
- e) Intentional introductions will only take place with authorization from an accredited agency or authority. Authorization will require comprehensive evaluations based on risk assessments.
- f) restricting imports and internal movements of IAS that present invasion risks. This is important to support containment strategies and prevent spread to other areas.

Even the best prevention efforts cannot stop all introductions. Early detection of an imminent invasion and quick coordinated responses are needed to eradicate or contain an invasive species before it becomes too widespread and control gets to be practically and/or financially impossible. Although early detection and rapid response are important elements of invasive species management, currently there is no comprehensive national system in Uganda for detecting, responding to and monitoring imminent invasions. The guiding principles for detection of introduction of IAS into Uganda are:

- a) Early detection of new introductions of potential or known invasive species, together with the capacity to take rapid action, is key to successful and cost-effective eradication;
- b) Lack of scientific or economic certainty about the implications of a potential biological invasion should not be used as a reason for postponing eradication, containment or instituting other control measures;
- c) The best opportunities for eradicating or containing IAS are in the early stages of invasion, when populations are small and localized;
- d) Eradication of an invasion is preferable and is more cost effective than long-term control, particularly for new cases;
- e) Eradication should not be attempted unless it is ecologically feasible and has the necessary financial and political commitment to be completed;
- f) A strategically important focus for eradication is to identify points of vulnerability in the major invasive pathways such as international airports and other border entry points.

Failing complete eradication, IAS must be managed in perpetuity through appropriate control measures. A good example in Uganda is the water hyacinth which invaded a large portion of the major rivers and lakes. This species has re-surfaced again and species will have to be judiciously managed in perpetuity for sustainable use of inland waters. The guiding principles for control and management of IAS in Uganda are:

- a) Control methods should as far as possible be socially, culturally and ethically acceptable, efficient, and non-polluting but should be weighed against the prospect of not doing anything;

- b) Specific methods are better than broad spectrum ones. Biological control agents may sometimes be the preferred choice compared to physical or chemical methods but require rigorous screening prior to introduction to minimize any potential risks;
- c) Physical removal can be an effective option for clearing large areas of invasive species but may be expensive;
- d) Where chemicals must be used, they should be as specific as possible, non-persistent, and non-accumulative in the food chain. Persistent organic pollutants, including organochlorine compounds, should not be used;
- e) Local community involvement including youth and women in the control and management of invasive species is essential and should be encouraged and promoted;
- f) A multi-sectoral approach for control and management of invasive species should be put in place;
- g) Enforcement of laws and regulations related to invasive species should be part of the programmes and activities on the control and management of invasive species.

On restoration of areas degraded by IAS, the guiding principles are: identification and prioritization of sites to be restored, developing and integrating implementing rehabilitation plans/programmes into sectoral plans and programmes at all levels and sharing of experiences among stakeholders.

Two other outcomes of the project which will assist Uganda in further implementation of Aichi target 9 was the identification of IAS plants that needs to be urgently controlled (Table 9)

Table 9: List of IAS for urgent control in Uganda

<b>Botanical Name</b>	<b>Common Name(s)</b>	<b>Remarks</b>
<i>Acacia mearnsii</i>	Black Wattle	Its tannin-rich bark is used in leather industry. It is also a source of timber, woodchips, firewood and building materials. Possible to contain it to acceptable levels.
<i>Broussonetia papyrifera</i>	Paper mulberry	The main area of focus in Uganda is Budongo and Mabira Forest Reserves. Source of fuel wood, control of its population to acceptable levels is feasible.
<i>Calliandra calothyrsus</i>	Calliandra	Extensively used in agro forestry for fodder and firewood. It is possible to contain.
<i>Senna spectabilis</i>	Cassia	Common in Bwindi Impenetrable National Park, Budongo Forest Reserve. Good source of building poles and firewood, resilient to drought and termite

<b>Botanical Name</b>	<b>Common Name(s)</b>	<b>Remarks</b>
		attacks, possible to contain.
<i>Leuceana leucocephala</i>	Miracle tree	Extensively used in agro forestry as fodder and firewood resource. Containment is possible.
<i>Grevillea robusta</i>		Extensively used in agro forestry for timber, fodder and firewood. Possible to contain.
<i>Salvinia molesta</i>	Kariba weed, giant salvinia.	A free floating water fern often used as ornamental in aquarium. Biological control using the host specific weevil, <i>Cyrtobagous salviniae</i> has proved effective.
<i>Pistia stratiotes</i>	Water lettuce, Nile cabbage.	Biological control method has been identified. <i>Neohydronomus affinis</i> is a very effective agent.
<i>Eichhornia crassipes</i>	Water hyacinth	Considered world's worst aquatic weed. Biological control possible but eradication not feasible.
<i>Lantana camara</i>	Lantana	Particularly abundant in Iganga/Pallisa districts The thickets exclude other spp., reducing biodiversity. Eradication is impossible.
<i>Acacia spp. e.g. Acacia hockii</i>	Acacia	Common in south western Uganda mainly in the rangelands; it displaces other native species that are more palatable to livestock
<i>Striga hermonthica</i>	Striga	Serious weed on agricultural lands lowering crop yields
<i>Mimosa pigra</i>	Sensitive plant	Common along river banks and lake shores; it covers other vegetation; it prevents human movement (nasty spines); not currently a serious invasive species but has the potential to expand
<i>Cymbopogon nardus</i>		Common in rangelands where they are unpalatable to livestock. Particularly common in Rakai district and Lake Mburo National Park.

**Case study on Aichi target 12:** By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained which falls under goal C on improving the status of biodiversity by safeguarding ecosystems, species and genetic diversity. The national target that has been set for this Aichi target is that “By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of vulnerable species, has been improved and sustained”.

In Uganda biodiversity loss is greatest outside protected areas and therefore species of plants and animals that are targeted because of their socio-economic values are under threat. One of such plants is the shea butter tree (*Vitellaria paradoxa*). The tree, and found in unbroken belt approximately 5,000 km long by 500 km wide from Senegal to Uganda and Ethiopia. The species is of African origin. Shea tree occurs in 19 countries across the African continent, namely Benin, Ghana, Chad, Burkina Faso, Cameroon, Central African Republic, Ethiopia, Guinea Bissau, Cote D’Ivoire, Mali, Niger, Nigeria, Senegal, Sierra Leone, Sudan, Togo, Uganda, Zaire and Guinea (Fig 1). It covers an almost unbroken belt approximately 6000 x 500km from Senegal to the northern parts of Uganda.

In Uganda the trees (*Vitellaria paradoxa*) are found primarily in the North-eastern districts of Lira, Dokolo, Kaberamaido, Gulu, Kitgum, Pader, Amuru, Abim, Amuria, Katakwi and Soroti and also in the West Nile districts of Nebbi, Arua, Yumbe, Koboko, Moyo and Adjumani, with a small and isolated population in Nakasongola district. Shea grows naturally in grasslands and does not need irrigation, fertiliser, or pesticides. It survives in very arid areas and its thick bark protects it from bush fires. Living for 300 years or more, habitats of shea trees can act as carbon sinks. Shea has significant ecological and economic potential for livelihood improvements; all parts of the tree can be used, including the fruit, roots, leaves and bark. The shea fruit is of particular importance due to the oil extracted from it, which has enormous nutritional and health benefits besides being a source of income.

Shea butter is used as a base for many commercial preparations. Increasingly, cosmetics, especially those that prevent skin drying and good-quality lipsticks, use shea butter. Shea Butter is naturally rich in Vitamins A, E, and F, as well as a number of other vitamins and minerals. Vitamins A and E help to soothe, hydrate, and balance the skin. Shea butter has a fatty composition similar to that of cocoa butter, so is often used as a substitute for cocoa, and in pastry because it makes highly pliable dough.

The shea fruit has enormous nutritional benefits that are also important for health purpose. Studies carried out by Natural Chemotherapeutic Research Institute (NCRI) have established that shea fruit contains the following: Crude fat - 1.5-3.5 g/100g; Crude protein 3-4 g/100g; Total carbohydrates - 60-64g/100g; Vitamin C 80-120mg/100g; Essential mineral; Ca (35.18-95.58 mg/100g); K (42.04-63.55 mg/100g); Mg (18.14-24.21mg/100g); Na (7.07-18.12 mg/100g) & Fe (3.41-3.76 mg/100g)

Thus despite the importance of shea butter trees to both Ugandans and the international community, the resource is under serious threat due to the high demand for charcoal from the tree. This is taking place in all the districts where shea butter trees are found. This is not only leading to loss of the species but also degradation of the fragile parkland savannah ecosystems. Already the region is expressing increase in the dry spells especially in areas where there is heavy destruction of the shea butter trees. Nearly all the trees are now known to have been cut in Nakasongola district for charcoal production. A degraded environment especially along the shea belt (a fragile savannah ecosystem) will in turn affect agricultural production and undermine poverty eradication efforts.



Above Shea trees cut for charcoal production. Below are buys of charcoal from shea displayed on the road side in Ikwe in Otuke district (Photograph by Sabino Francis Ogwal December 2009)



The massive cutting of shea trees for charcoal production has resulted into the tree being threaten and may be extinct not far from now. In order to protect the shea tree from further destruction, Government instituted a programme on the protection of the shea trees. This has been spearheaded the Directive from His Excellency the President of the Republic of Uganda. The President has Directed that trees be protected and communities assisted to use the trees sustainably.

The Directive from His Excellency the President of the Republic of Uganda has been instrumental in the drive protect the shea trees. Law enforcement officers at the district level were trained on enforcement of environmental laws. This coupled with awareness campaigns has resulted into less shea trees being cut. From the lessons learnt in the protection of the shea butter tree, a National Strategy for the Protection and Sustainable Use of the Shea Trees in Uganda is being developed and is expected to be completed by or before end of December 2014. The implementation of this strategy contributes to implementation of the directive of His Excellency the President of the Republic Uganda on the Protection of Shea butter trees, the National Development Plan Vision 2040 and Aichi target 9.

Furthermore Government embarked on resource mobilization to protect the shea trees and promote sustainable use. The result is a GEF support through United Nations Development Programme (UNDP) for a project on the Conservation and Sustainable Use of the Threatened Savanna Woodland in the Kidepo Critical Landscape in North Eastern Uganda. Some of the expected outcomes of the project that relate to the shea trees are:

- a) District local governments cooperate effectively to regulate and plan natural resource use over 227,389 ha of the critical landscape, resulting in a landscape level coordination mechanism that enshrines biodiversity conservation
- b) An organic certification system set up and functioning for the export of shea products from the Kidepo Critical Landscape

The project is also expected to deliver the following outputs which will further enhance the protection of the shea trees:

- a) Sustainable use options for Shea tree resources resulting in reduction of pressure on savannah habitat in the landscape
- b) Mechanisms (landscape level coordinated management plans and institutional governance systems) for enhancing sustainable management of Kidepo critical landscape promoted, with landscape management plan in place and enforced
- c) Local Governments have the competence and staff skills to monitor and enforce laws on sustainable hunting and sustainable harvest of Shea tree in target districts, measured by a 40% increase in scores in capacity development scorecard
- d) Measures to improve market access for Shea products in place, and employment and income generation among rural women increased through access to markets

- e) District ordinances and community by-laws on the harvest of Shea trees reinstated or developed - resulting in 25% reduction in shea tree deforestation and a 50% drop in the use of shea for charcoal

**Case studies on Aichi target 15** under strategic goal D on enhancing the benefits to all from biodiversity and ecosystem services. This target states that “By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification. The national target is that “By 2020 ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification”.

Uganda is among the least prepared and most vulnerable countries to climate change in the world. Many parts of Uganda are already experiencing the impacts of climate change such as frequent droughts, famine, floods and landslides, and their knock on consequences on natural resources, agriculture, food security and livelihoods. The case studies below illustrates this point.

### **Case Study 1: Kasese District**

Kasese district which is located in the Mt. Rwenzori region is one of the richest biodiversity areas in Uganda. Over the past years (1980 – 2010), the district has experienced an increase in annual temperature ranges. One of the evidence of the increasing temperatures in the region is the accelerated melting of the Mt. Rwenzori ice caps observed over time.

The District recently experienced heavy floods (May 2013), which are believed to have been caused by the glacial meltdown due to the regional increase in temperature, combined with a heavy down pour in the Mt. Rwenzori ranges that lasted for a week. This led to severe flooding in the major rivers of the district (Nyamwamba, Nyamugasani, and Mubuku), and the adjacent areas located in the rivers' flood plains.

The Catchments of these rivers have several socio-economic activities being undertaken within, by both the public and the private sector. These include; agriculture, industry, settlements/urbanization, energy production (Hydro-electric Power generation) and wildlife conservation. Analysis carried out on the damage of ecosystems from the recent floods experienced in the district identified the following as the major drivers of this disaster.

- a) Human activities (deforestation and poor farming methods on the slopes and flood plain) in the upper and lower catchments of the river valleys were gradually weakening the catchment area thus culminating into the damages caused by the flood.
- b) The haphazard/unguided developments in the municipality have also contributed to the damage within the Municipality. A case in point is houses that have been constructed in

clearly marked drainage channels originally created to accommodate Nyamwamba river flood waters

The assessment indicated that infrastructure such as roads and bridges were damaged, submerged and/or washed away. Houses collapsed resulting into displacement of the local people. Agricultural fields destroyed by silt deposits damaged food crops leading to food insecurity among the affected local communities.

It was however noted that, areas substantially covered with woodlots did not experience devastating damage compared to the degraded areas. Forests and other woodlots are important ecosystems which at the same time serve as major carbon sinks and storage systems. Natural growth in forests and other woody formations absorb significant quantities of Carbon dioxide (CO<sub>2</sub>) such that in situations where there are no excessive wood harvests and deforestation, the forests act as net CO<sub>2</sub> removers.



Figure 22: Impact of floods on biodiversity and local infrastructure in Kasese district (Source: CCU File Photos 2013)

### **Case study 2: Bududa District**

Landslide occurrences in Bududa district have been largely due to anthropogenic activities. These activities such as poor farm management practices, have led to clearance of vegetation cover on the hill slopes, and destabilization of the soil top layer acting as precursor to landslide occurrences that have recently occurred during the heavy downpours caused by climatic variabilities in the district, hence accelerating the frequency and magnitude of the recent landslides.

Available information indicates that the heavy rains experienced in the period of October 1997 to January 1998 caused landslides which killed 48 people and displaced 10,000 from the slopes of Bududa. The heavy rains in August and September 2007 left 5 people dead, crops destroyed and a lot of property damaged, whereas the recent rains (August 2013), have left most of the residents homeless.

Eighty percent of Bududa is a fragile ecosystem because of its extreme steepness and its high population of an average density of 952 people per km<sup>2</sup>, making it one of highly populated areas in Uganda. The estimated land holding per person is at 32 m<sup>2</sup> which creates extreme pressure on land. These scenarios, compounded with the changes in local climate have increased the vulnerability of the local communities' landslides impacts with potential severe consequences on the surrounding biodiversity, thus undermining the communities' livelihood.

Up to the 1980's, most parts of Bududa district had adequate forest and tree cover including the mountain slopes. However population increase over time together with various negative anthropogenic activities on environment and natural resource, has led to a reduction in forest and tree cover on slopes. This is directly attributed to the increasing population of the local communities as they continuously cut down trees on the hill slopes to clear land for agricultural. This trend has led to loss of biodiversity and ecosystem services while facilitating landslides occurrences and siltation of rivers and water bodies downstream. The situation is likely to become worse due to sediment deposition into rivers, causing siltation of river channels and wetlands downstream resulting into floods and loss of aquatic biodiversity which in turn will have negative impacts on the surrounding communities.

The two case studies above and other challenges of climate change facing Uganda resulted into Government mobilizing financial resources for a pilot project on Ecosystem Based Adaption (EBA) which aims at building strong resilience for ecosystems as a basis for livelihood improvement and adaptation. The overall objectives of the project are to: (i) to strengthen Uganda's capacity for promoting ecosystem based adaptation (EBA) options and (ii) to reduce the vulnerability of communities to climate change impacts with particular emphasis on the mountain Elgon ecosystem.

The project objectives are to be achieved by supporting Uganda and local communities in the target Districts to adapt to the adverse impacts of climate change through improved biodiversity and ecosystem services, while taking into account risk management and resilience enhancement, as part of overall local and national level adaptation strategies.

The project will be directly aligned to the existing national policy, legal and institutional frameworks for climate change adaptation as well as environmental, biodiversity and ecosystem management. The project will also be aligned to the 4 components of UNEP, UNDP and IUCN Global Ecosystem Based Adaptation in Mountain Ecosystems program<sup>1</sup> implemented in the 3 countries of Uganda, Nepal and Peru.

The project will give special emphasis to testing appropriate tools and methodologies, learning lessons and capturing experiences and practices that can be replicated in most parts of Uganda. It is also expected that the lessons, experiences and practices from Uganda will be shared among the other countries implementing EBA (Nepal and Peru) and can serve as a platform for

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<sup>1</sup> The Ecosystem Based Adaptation partnership programme between UNEP, UNDP and IUCN is supported by Germany's Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU) to be implemented in Peru, Nepal and Uganda worth Euro 10 million.

developing and strengthening the adaptation tools and methodologies at global level and using practical field experiences.

The EBA project is consistent with development objectives set forth by the Government of Uganda National Development Plan (2010/11-2014/15). The NDP outlines four objectives with respect to the climate change sector, namely: 1) develop national capacity for coordination and implementation of climate change adaptation and mitigation activities in support of social welfare and national development; 2) ensure climate proof development planning; 3) promote low carbon development path; and 4) meet Uganda's international obligations on climate change.

The NDP recognizes the environment, natural resource management and the climate change as enabling sectors and emphasizes the challenge to sustainable development in the country. However, the links between environment management, climate change adaptation and mitigation and poverty reduction is not yet assessed at the country level.

Government of Uganda's National Adaptation Programme of Action (NAPA) recognises that highland ecosystems are particularly vulnerable to climate change impacts. The NAPA particularly notes that occurrence of landslides is concentrated in the highland ecosystems, while flooding occurred in lowland ecosystems. The Mt. Elgon ecosystem has experienced both incidences, with strong landslides in Bududa and Bulambuli while floods occurred in Teso and Butaleja downstream.

This project will have a number of beneficiaries at local, national and global levels. The main beneficiaries are the local communities in the mountain ecosystems of Uganda, whose livelihoods is dependent on the natural resources and mountain ecosystems. It is expected that successful implementation of the project will lead to more resilient ecosystems. This will not only reduce the risk of climate related disasters but will enhance the provision of ecosystem goods and services including carbon stocks.

The project will also benefit local government institutions and NGOs by providing them an opportunity to participate in the development, testing and dissemination of tools and methods for ecosystem based adaptation. Lessons learnt from the process will be used for integrating climate change in the different development plans and programmes in Uganda including implementation of NBSAP. The project will also provide an opportunity for capacity development to the central government, local government and NGO teams. At national level there will be benefits of getting experiences and practices that can be transferred to other mountainous and hilly parts of Uganda such as the Kigezi and Rwenzori highlands.

**Case study on Aichi target 17** under strategic goal E enhancing implementation through participatory planning, knowledge management and capacity building requires that “By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan”.

#### *The approach*

The current NBSAP was developed by a team of consultants between 1998 and 2002. Stakeholder holder engagement was mainly at validation workshop. One major drawback from this approach was limited ownership of the process and therefore inadequate understanding of NBSAP and its implementation. Basing on this lesson, the review and updating of NBSAP2 took another approach.

First Uganda participated in the capacity building workshops that were organized by the CBD Secretariat on the process for the review and updating of NBSAPs. Equipped with this knowledge, the CBD National Focal was given the responsibility to take lead in the review and updating of NBSAP1. Two approaches were used: A Thematic Working Group and a local consultant. The entire process was coordinated and supervised by the CBD National Focal Point. Overall technical guidance was provided by the Technical Committee on Biodiversity Conservation.

The first step used by the CBD National Focal Point was to identify stakeholders to participate in the NBSAP process, develop draft Terms of Reference for the Thematic Working Group and a draft road map to guide the NBSAP review and updating process in Uganda prior to the national capacity building workshop. Members of the Thematic Working Group were drawn from Government Ministries, Department, Agencies, Academia and Research Institutions, the Private Sector and NGOs. A capacity building workshop was carried to create awareness and understanding about the NBSAP and the NBSAP review and updating process. The following presentations were made:

- a) Overview of the Convention on Biological Diversity and the CHM prototype
- b) Policy, laws and institutional framework for biodiversity management in Uganda
- c) Status of forest reserves in Uganda, challenges and priority programmes/actions for addressing the challenges
- d) Status of wetlands in Uganda, challenges and priority programmes/actions for addressing the challenges
- e) Management of environmental requirements of Oil exploration in the Albertine Graben: Achievements, challenges and opportunities for enhancing environmental quality and protection of biodiversity
- f) Effluent discharges into the Inner Murchison Bay and at its potential impacts on aquatic biodiversity and human health
- g) Overview of Uganda’s NBSAP and the NBSAP review process

- h) Strategic Plan for Biodiversity 2011 – 2020 and the Aichi Targets
- i) Mainstreaming Biodiversity into sectoral plans, policy and programmes
- j) Business and Green Procurement
- k) REDD+ Safeguards and its relevance to the protection of biodiversity
- l) Setting national biodiversity targets within the framework of the Aichi targets
- m) Introduction to developing indicators for monitoring biodiversity
- n) Setting Indicators for national biodiversity targets

The above topics were tailored to expose stakeholders to the CBD, the NBSAP and its importance, the strategic Plan for Biodiversity 2011-2020 and its Aichi target, the Strategic Plan for the Cartagena Protocol on Biosafety 2011-2020, the status of Uganda's biodiversity and the need for synergies in the implementation of NBSAP among others. This proved very instrumental in the latter stages of NBSAP review as stakeholders had acquired knowledge and understanding of NBSAP. This was further enhanced with the development of the TORs for the Thematic Working Group. At the end of the Capacity building workshop, the following key outputs were agreed upon by the stakeholders:

- a) The draft TORs to guide the work of the Thematic Working Group was reviewed and adopted.
- b) Four Thematic Working Groups were agreed to guide the stock-taking of baseline information to inform the NBSAP review and updating process upon namely:
- c) Thematic Working Group on the status and trends of aquatic and terrestrial biodiversity in Uganda
- d) Thematic Working Group Policy, legislation and instructional framework for biodiversity conservation in Uganda
- e) Thematic Working Group Biodiversity for National Development, Socio- Economic Development and Wealth Creation
- f) Thematic Working Group on the Status of Biotechnology and Biosafety in Uganda

Additional outputs from the workshop were:

- a) Review and approval of the draft road map for the NBSAP process.
- b) Inception report by each Thematic Workshop Group which agreed on the task of each member of the group and the time frame for completing the tasks
- c) A report structure for each working group presented in the plenary, discussed and approved

Thematic Working Group meetings were held to receive and provide input on progress reports on stock-taking by each group. In these way gaps in the reports were identified to able each group complete its work. Upon completing the report on stock-taking, each working group was assigned the task of developing draft national biodiversity target within the framework of the Aichi targets. This depended on the relationship between the Aichi target and the baseline information that each working group gathered. The provisional national targets were review by the

entire thematic working group during plenary discussions. The provisional national targets were sent the local consultant for further refinement.

#### *Outcomes of the approach*

- a) Sharing of information among stakeholders has been greatly enhanced. Each member of the thematic working group brought the most up to date information from his/her institution. Consultants would have even found it difficult to access such information.
- b) The entire review and updating of NBSAP process has been owned by the different stakeholders. This led to stakeholders setting national targets that are relevant to their sector but also achievable.
- c) Each national target has been assigned to a specific Government institution and these are referred to as target/biodiversity champions. The target/biodiversity champions will take lead in implementing and report on the national target assigned to them
- d) Resource mobilization for implementation of NBSAP with the Ministry of Finance, Planning and Economic Development has been facilitated through the involvement of the Ministry in the review and updating of NBSAP
- e) Issues on biodiversity has been included the long term development vision for Uganda – Vision 2040. This was a result of involving participation of the National Planning Authority in the work of the Thematic Working Group.

#### *Lessons learnt*

- a) The approach is very effective in stakeholder involvement and ownership of NBSAP.
- b) Stakeholders are more willing to share information with a Government agency rather than a consultant.
- c) Proper and effective coordination is needed for the entire approach to work. A dedicated, committed and knowledgeable person on the CBD, NBSAP and NBSAP review and updating process is vital.

**Case study on Aichi Target 18** under Strategic goal E on enhancing implementation through participatory planning, knowledge management and capacity building states that “By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels”. The corresponding national target for this Aichi target is “by 2017, traditional knowledge and practices of local communities integrated into the conservation and sustainable use of biodiversity at all levels with community participation”.

Status of medicinal plants was not provided in the fourth national report. Whereas there is scanty information on the quantity of medicinal plants consumption, majority of people in Uganda rely on it for primary health care. It is estimated that 80% of Ugandans depend on indigenous medicine. Medicinal plants are less costly and more accessible than allopathic. Regional traditional medicine community centres have been established. This is an outcome of project on Medicinal Plants and Biodiversity funded by IDRC.

With the emergence of HIV/AIDS and other non communicable diseases like diabetes, cancer and hypertension, and the inaccessibility of allopathic medicine, patients have turned to indigenous healing systems (that predominantly depend on local medicinal plants) to treat HIV related opportunistic diseases and infections. This is in addition to the treatment of zoonotic and other diseases like malaria, abdominal pain, skin diseases, headache, worms, ulcers, epilepsy, among others.

Despite the importance of medicinal plants, about 1% of the 250,000 species of higher plants known to have medicinal values have had their biomedical potential determined. The remaining 99% is disappearing rapidly together with the associated traditional knowledge and practices. The causes of disappearance range from habitat loss to unsustainable harvesting. Emphasis is on collection from naturally existing stock with minimal deliberate strategies focused on the conservation of targeted species. Poor methods of processing, packaging and marketing of medicinal plants not only results in losses but also limits the acceptability and marketing of medicinal plants.

Over the past years, over-exploitation, destructive harvesting practices, deforestation, agricultural expansion, overgrazing infrastructure development and population pressure have had negative implications on the sustainability of medicinal plants. Besides, relevant IK and practices on Medicinal Plants (MP) conservation have not fully been documented, since it is most orally transmitted from generation to generation. Thus a study was carried out on the Role of Indigenous Knowledge and Practices in the Conservation and Sustainable Use of Medicinal Plants in Uganda. It was supported the GEF through UNEP under a project on Developing a National Clearing House Mechanism and Capacity Assessment for Taxonomy and Indigenous Knowledge.

From the study it was established that collection of medicinal in Uganda is done to meet the PHC needs of the population. This process can result in destruction and possible extinction of important MP in the long term. The problem is worsened, as most MP are collected from the wild sources, thus depletion of wild stocks, when demand exceeds supply. An indicator of overexploitation has been noticed on the reduction of stocks of MP collected by herbalists and the long distances travelled by herbal collectors and vendors in search of MP from the wild.

The study further found out that the increasing human population in Uganda is leading into encroachment and destruction of important habitats for medicinal plants such as natural forests, wetlands and rangelands. Some parts of Uganda for example Kabale district have experienced exponential population growth and as a result, land has been fragmented and wetlands reclaimed. A recent survey for the status of anti-malarial medicinal plants in Kabale district by the NCRI indicated that *Vernonia amygdalina* that was very common in Kabale district in the last decade, and is commonly used by the herbalists for treatment of malaria and other ailments has reduced

significantly in distribution. This was indicated by the long distances travelled by the THPs in search for *V. amygdalina*, when required as well as the reduced population densities of the plant. Similarly, the reduction in number of species e.g. *Zanthoxylum sp P. africana* and *Warbugia ugandensis* due to deforestation in the area has also been noticed.

However, Indigenous knowledge provides opportunity for the conservation and sustainable use of medicinal plants. The TK and practices in application of plants in treatment of diseases has created a need for their conservation among users. In various parts of Uganda for example, making of incisions on the forehead and the temple, and rubbing in certain herbs to treat recurring headache or rubbing certain herbs into incisions made on the other parts of the body to neutralize snake poison or any other poisons is a common practice. Such important IK and uses, promote conservation of medicinal plants around homes. Indigenous knowledge system and practices such as beliefs and habits of a community are still important in conservation of medicinal plants. A particular community may have knowledge on geographical distribution, rarity and extent of exploited species.

In Uganda traditional methods of harvesting of ensure its sustainability over a long period of time. From the study some of the IK techniques or methods used traditionally in sustainable harvesting of in Uganda include the following:

- a) *Selective harvesting practices of the plant parts*- in preparation of certain medicinal remedies the plant parts are collected in a specific manner e.g. Leaves of *Lantana camara* used as decoction for treating persistent cough. In this example, it is specified that the dead leaves which have actually fallen off the trees are used rather than the green leaves on the plant, thus conserving the plant.
- b) *Collection of bark* – It was traditionally believed that bark from a tree should only be collected for medicinal purposes from the east- and west-directions of the trunk. Bark taken from the north and south directions was believed to be ineffective for curative purposes.
- c) This method of collection of MP prevents ring barking (which would kill the entire plant) hence ensures that the plant is conserved. Although the MP is partially de-barked, it is not killed and the remaining sections of bark help in transportation of the required nutrients (mainly food manufactured in the leaves) and in producing new bark to cover up the wound created by the harvesting on the eastern and western sides.
- d) *Collection of roots* – The root is very important part of MPs, poorly harvested roots can cause death of the MP. Good traditional methods of collection of roots, for medicinal use are done by ensuring that not all the plant roots are collected. This is because the MP should still need the remaining roots for support and survival through absorption of water and mineral nutrients. Culturally, there is a belief that if a part of a plant is collected for medicinal use and as a result that plant dies, then the patient being treated with that medicine is likely to die too. This IKS is to ensure careful harvesting, hence conservation of the MP.
- e) *Prohibition of re-collection of medicinal plant* - Collection of the bark, roots branches and leaves from a MP that shows signs of previous collection were prohibited culturally. It is believed that when a THP has used a plant to treat a patient, the patient's disease can get

transferred into that plant and therefore when another THP subsequently uses the same plant to treat a patient, the disease of the previous patient would be transmitted to the new patient. This kind traditional belief ensured that the MP recovered from the effects of previous collection and thus conservation.

- f) *Use of annuals* – In this case, whenever a THP collects annuals for medicinal use, s/he must leave behind some individuals of the species at the collection site. It is believed that if a MP species was completely destroyed in a particular area, then the patient to whom the medicine was administered would also die. By leaving behind some representatives of the collected species, localized rare species were protected from disappearance.
- g) *Non collection of seeds* – Traditionally, seeds of plants were rarely used for medicinal purposes. The only cases when they were used are usually as a lucky charm placed in a pocket or hung around the neck. This limited use of seeds allowed the perpetuation of plant species through seedlings.
- h) *Collection of sap* - Some MP have their sap used as medicine e.g. *Euphorbia* spp. A mark is made on the stem and sap is collected in a container without destroying the mother plant

The study further revealed that Government of Uganda has recognized the need to establish standards for use, safety, efficacy and quality of such traditional remedies. Collaboration with traditional medicine practitioners have been established by Government with the following objectives:

- a) To encourage an approach to evaluating and improving the safe, effective, and sustainable use of medicinal plants in Uganda that integrates the professional expertise and knowledge of traditional health practitioners with that of health workers;
- b) To identify the most common diseases and the medicinal plants used by the traditional healers to treat them in the selected project areas, and to identify a small number of target remedies for research on conservation, safety and efficacy based on anticipated benefits to health care in Uganda;
- c) To assess the collection, trade, and conservation status of the target medicinal plants
- d) To strengthen the capacity of NCRI to develop and implement valid, ethical, and feasible protocols for evaluating the safety and efficacy of indigenous health remedies in Uganda;
- e) To clarify and establish equitable arrangements for intellectual property ownership and benefits from information contributed to research by traditional health practitioners and indigenous local communities;
- f) To disseminate the research findings concerning safe, effective, and sustainable use of the targeted indigenous health remedies among current and potential users, including traditional health practitioners, community health specialists and practitioners of allopathic medicine within Uganda and internationally.

- g) To propose guidelines for the sustainable harvesting of medicinal plants and improved preparation of indigenous medicinal remedies.

There is on-going effort to promote indigenous medicine. A law for the recognition, protection and practice of indigenous medicine has been developed by the Uganda Law Reform Commission. NARO is integrating the modernization and commercialization of indigenous knowledge for wider economic and social benefits in areas such as food production, cosmetics, pharmaceuticals, aromatics and handcrafts. A national policy targeting indigenous and complementary medicine is in place and has increased awareness on the need to have of legal framework.

Uganda National Drug Authority (NDA) has a Committee on Indigenous Medicine to oversee activities related to use of Indigenous medicine in Uganda. Several NGOs and CBOs are involved in efforts aimed at promoting the conservation of medicinal plants, particularly those that are highly threatened. There have been efforts to propagate threatened species such as *Prunus africana*. The key outcomes of the interventions on indigenous medicine are: Increasing acknowledgement and recognition in the country of the role of medicinal plants in the national healthcare system. Interest in indigenous medicine in general and in medicinal plants in particular has increased as more people have turned to using such remedies.

The study recommended creation of awareness on the values and practices of IK in conservation and sustainable use of medicinal plants, capacity building of cultural institutions and communities to conserve medicinal plants and enhancement of the policy, legal and institutional framework for conservation of medicinal. These and other findings on the role of TK in the conservation and sustainable use of biodiversity will be used to further enhance implementation of Aichi target 18.

**Case study on Aichi Target 19 under Strategic Goal E: The global target is that** “By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied. Uganda developed two national targets under this Aichi target that is meant to address issues on taxonomy. These are namely:

1. By 2020, basic taxonomic information is packaged in user-friendly formats and widely disseminated, including use of school systems
2. By 2020 The importance of taxonomy is mainstreamed in key development sectors and employment of taxonomists done in lead agencies

**Case study on taxonomy** - As part of implementation of national targets on taxonomist, Uganda carried out a study on the taxonomy capacity needs assessment. This was one of the activities under the GEF/UNEP project Developing a National Clearing House Mechanism and Capacity Assessment for Taxonomy and Indigenous Knowledge. The study was undertaking bearing in mind the importance of biodiversity and need to have reliable information on the status and

trends of biodiversity over time to inform decision making.

Furthermore during the tenth meeting of the Conference of the Parties to the CBD which took place in Nagoya, Japan in October 2010, Parties to the Convention agreed to take effective and urgent action to halt the loss of biodiversity 2020. Thus Uganda is required to share information on progress made in halting biodiversity loss. Taxonomists will be needed for Uganda to effectively report progress in this area. The study was undertaken by a team of experts from Academia, Research Institutions, Government Ministries, Departments and Agencies. It was coordinated and supervised by the CBD national Focal Point on behalf of NEMA. The areas covered in the assessment were:

- a) Reviewing the Global Taxonomy Initiative (GTI), the progress Uganda has made in the implementation of the decisions of the Conference of the Parties (COP) on GTI;
- b) Assessing the capacity of training institutions in the development of personnel in the field of taxonomy in Uganda, identifying strengths and gaps. Based on the findings, propose measures for improving national capacity for taxonomy;
- c) Assessing the taxa specific strengths of biodiversity related institutions (mainly personnel and infrastructure);
- d) Reviewing information on the taxonomy capacity needs of Uganda;
- e) Assessing the needs and priorities of taxonomic information end users;
- f) Compile an initial list of taxa for taxonomic capacity development

The findings of the study indicate that there is limited capacity in terms of personnel, tools and infrastructural for developing and utilizing taxonomic information in Uganda. Study found out that collecting data in the field is a challenge and therefore the need to improve generating data from the field through specialized training. Without good collections and identification, the material will be useless because the information that accompanies the name is as important as the name of the specimen itself. This training is envisaged at three levels namely: research taxonomists and ecologists and local collectors or parataxonomists.

The study found out that postgraduates from universities in Uganda need more practical training as well as field attachment. Undergraduates need to be trained in herbarium and museum techniques as well as collecting and handling various types of specimens, including identification techniques that are important for producing taxonomic tools.

The study pointed out the need for training of institutional based parataxonomists to increase the taxonomic information base so as to generate information in as much of the Uganda as possible. This will lead to properly identified reference collections and more complete field guides.

In Botany, taxonomy specialist's in-service training courses in the following areas are essential:

- i) Fungi (these are important for food security, income and medicinal properties)
- ii) Less known lower plants – Algae, lichens, bryophytes
- iii) Bioindicators of pollution and climate change such as lichens and Bryophytes
- iv) Ancient groups of plants such as cycads and conifers
- v) Commonly traded plants e.g. Orchids and succulent Euphorbia
- vi) Groups of socio-economic usage e.g. for herbal medicine, wild food, invasive species, agricultural weeds
- vii) Wetland and aquatic plants

In the zoological perspective, expertise for a number of taxa is necessary to create essential capacity. The groups for which strengthened or new capacities is critical include the following: -

Class: Crustacea (the Crustaceans), Tardigrades and Copepods

Class: Arachnida – Ticks, Spiders and Scorpions

Class: Insecta (the Insects). An identification key/guide is needed for each of the following:

- i. Diptera
  - a. Mosquitoes
  - b. Black flies (Simuliidae)
  - c. Tsetse flies
  - d. Midges (Chironomidae and Chaoboridae).
- ii. Siphonaptera (Fleas)
- iii. Isoptera (termites)
- iv. Thysanoptera (thrips)
- v. Hymenoptera (e.g. ants and bees)
- vi. Coleoptera (beetles)
- vii. Siphonaptera (fleas)
- viii. Lepidoptera (butterflies and moths)

Class: Nematoda (Nematodes)

Class: Pisces (Fishes)

Class: Amphibia (Amphibians)

Class: Reptilia

Based on the above, Government has planned to undertake the following to address taxonomy capacity needs of Uganda

1. Taxonomic knowledge bases are to be developed for biodiversity in formats that are accessible to end users. Such information can be used for national planning, prioritization; conservation action; and investment for trade, food security, health and economics.
2. User friendly taxonomic tools is to be developed such that technical information is packaged in formats that are appropriate for end users for example in bio-trade
3. Mobilization of financial resources Taxonomic institutions, such as research institutes, universities and museums which hold representative natural history collections with valuable

information should be funded, to increase personnel and improve infrastructure to make the information they hold available to the end users.

4. Creating awareness on the need for application of taxonomic information in many production sectors of the country such as agriculture, trade, and health, as well as development and regulatory agencies and local communities. These have a lot to gain from utilization of taxonomic information.
5. Taxonomy to be taught in subjects related to natural sciences in primary and middle schools throughout Uganda to increase public awareness. The universities and colleges include training of taxonomists a priority by including taxonomy as a basic course.
6. EIA study to include persons with taxonomic expertise for the proper determination of taxa that are likely to be impacted. This should enable stakeholders make informed decisions regarding the taxa.

The actions will help Uganda address the low level of recognition of the importance and use of the available taxonomy expertise as well as move towards developing more capacity. Taxonomist will play an important role in the gathering of information to assess progress of implementation of Aichi targets especially Aichi targets 6, 9, 12, 13 and 19.

**Case study on setting national targets for biodiversity** – This was done by the Thematic Working Group. This was based on the information provided on the status of biotechnology and biosafety in Uganda. The NBSAP1 was also reviewed to assess the strength, gaps and weaknesses on biotechnology and biosafety. Furthermore, the Thematic Working Group reviewed the relevant COPMOP decisions including the Strategic Plan for the Cartagena Protocol on Biosafety. This activity was lead by Uganda National Council for science and Technology the National Competent Authority for Biosafety and Biotechnology in Uganda in collaboration with NEMA, the institution that coordinates implementation of CBD.

The report from the Thematic Working Group recommended the need to strengthen issues on biotechnology and Biotechnology in NBSAP2 and hence the following have been done:

A specific objective has been developed on biotechnology and biosafety. The NBSAP1 did not have a specific objective on biosafety and biotechnology. The objective on NBSAP2 for biosafety and Biotechnology is “To harness modern biotechnology for socio-economic development with adequate safety measures for human health and the environment”. The Thematic Working Group further developed the following strategies for Biosafety and Biotechnology which will be included in NBSAP2.

- a) Assess national capacities in biotechnology and Biosafety
- b) Enhance the availability and exchange of information on Biotechnology and Biosafety

- c) Establish a mechanism(s) for continuous Human and Infrastructural Resource Capacity Development, deployment and retention
- d) Develop a fully functional National Biosafety System
- e) Enhance regulatory performance of the National Biosafety Committee and the Institutional Biosafety Committees
- f) Establish a national repository for plant and animal genetic resources

The Thematic Working Group also developed four national targets together with the activities and indicators for measuring progress as indicated below.

### **National target 1**

By 2018, public Awareness, Education and participation in Biotechnology and Biosafety are enhanced

#### Key indicators

- a) 20% level of awareness achieved by 2018 in participating institutions
- b) Increased participation and support by stakeholders
- c) Increased adoption of biotechnology for national development

#### Key activities

- (i) Implement a comprehensive and proactive Communication, Education and Public Awareness (CEPA) Strategy that reaches identified target sectors
- (ii) Develop a platform for information exchange among the different Biotechnology and Biosafety stakeholders
- (iii) Conduct specialized trainings in Biosafety for regulators and inspectors

### **National target 2**

By 2018, Biotechnology tools (molecular markers, genetic bar coding, etc) for identification, characterization and conservation of biodiversity developed and applied

#### Key indicators

- a) Biotechnology harnessed for the conservation of biodiversity
- b) Biotech tools developed and optimized for biodiversity conservation
- c) Mechanisms for continuous Human and Infrastructural Resource Capacity Development, deployment and retention

#### Key activities

- (i) Implement a comprehensive and proactive Communication, Education and Public Awareness (CEPA) Strategy that reaches identified target sectors
- (ii) Assess national capacities in biotechnology and Biosafety
- (iii) Establish a mechanism(s) for continuous human and infrastructural resource Capacity Development, deployment and retention

### **National target 3**

By 2015, the National Biotechnology and Biosafety Law in place

#### Key performance indicators

- a) National Biotechnology and Biosafety Law
- b) National Biosafety Committee supported to effectively perform its functions

#### Key activities

- (i) Incorporate issues on liability and redress in the draft Biotechnology and Biosafety Bill
- (ii) Support Enactment of Biotechnology and Biosafety Law
- (iii) Popularize the Biosafety and Biotechnology Policy and Biotechnology and Biosafety Act (when passed into law)
- (iv) Promulgate guidance on Biosafety compliance
- (v) Enhance regulatory performance of the National Biosafety Committee and the Institutional Biosafety Committees

### **National target 4**

By 2015, the Nagoya –Kuala Lumpur Supplementary Protocol on Liability and Redress under the Cartagena Protocol on Biosafety is acceded to by Government

#### Key performance indicators

- a) Cabinet paper for accession Nagoya –Kuala Lumpur Supplementary Protocol on Liability and Redress
- b) Date of accession to the Nagoya –Kuala Lumpur Supplementary Protocol on Liability and Redress
- c) Increased compliance with national and international requirements

#### Key activities

- (i) Prepare Cabinet paper for accession
- (ii) Hold a consultative meeting with the Committee of Parliament on Agriculture, Science and Technology; Environment and Natural Resources to expedite accession
- (iii) Popularize the Nagoya- Kuala Lumpur Supplementary Protocol on Liability and Redress
- (iv) Seek Cabinet approval for accession

Progress has been made on the entire national targets stated above. The first four planned activities under target 4 have been carried out. What remains is getting Government approval. Uganda is expected to accede to the Supplementary Protocol by or before June 2014. Wide stakeholder consultations have been carried out under target three including members of Parliament. The Committee of Parliament on Science and Technology is carrying out nation - wide stakeholder consultations on the Bill and after that the Bill is to be presented to Parliament for approval. Implementation of activities for 1 and 2 are going. Implementation of activities under target 1 has contributed to achieving target 1. However more awareness needs to be done.

**Case study on Target 20** under strategic goal E requires that “By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels”. Two national targets were set under this Aichi namely:

- a) By 2014, a study is undertaken in respect of CBD Decision X/3 and guidelines for financing biodiversity in Uganda developed
- b) By 2017 finance resources for effectively implementing NBSAP2 is increased by at least 5% of the current level

With respect to national target on undertaking a study in line with Decision X/3 and developing guidelines for financing biodiversity, this is on course. Inadequate financing has been cited as one of the factors affecting implementation of the NBSAP in previous National Reports for Uganda and the same is true in the Fifth National. Therefore decision makers in Government especially Ministry of Finance, Planning and Economic developed needed to be provided with information on the financial resource allocation by Government to biodiversity conservation and management as well as bi-lateral and multi-lateral support for Biodiversity Conservation.

Aware of the gaps on information on biodiversity financing, a study was commissioned by NEMA on behalf of Government to assess biodiversity financing using the guidance provided in Decision X/3 on the Strategy for Resource Mobilization and to prepare Guidelines and Action Plans for Financing Biodiversity in Uganda. The study is coordinated by the CBD National Focal Point on behalf of NEMA. Financial support for this activity was from the GEF under UNEP on Expedited Enabling Activity Support to Uganda for the Revision of the NBSAP and Development of Fifth National Report to the CBD.

Traditional financing for biodiversity conservation revolves around the use of government expenditure and overseas development assistance (ODA) for biodiversity conservation. Early assessments conducted in the late 1990s (Emerton 1999) estimated that the government spent about US\$3.27 million/year on public sector activities related to biodiversity conservation. Even though this amount of funds was reasonably high at the time, it was insufficient to address all of biodiversity conservation concerns.

Since the 2005/06 financial year, the budgetary allocation for biodiversity conservation related investments at the national level have increased. Investments in tourism and wildlife management, environment management and agriculture have increased from \$20 to \$27.7 million, \$65 to \$82 million and \$59 to \$139 million for tourism and wildlife, water and environment and agriculture respectively. The investments shown in Figure 23 show both government and donor support in the on-budget resources reported in BFPs, and MTEF.

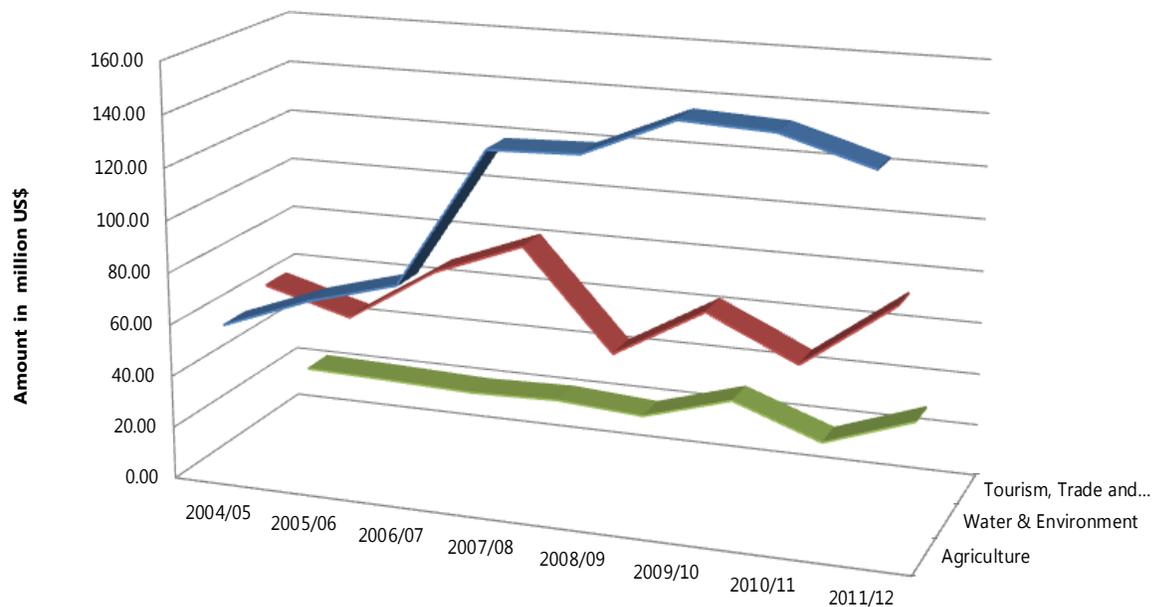


Figure 23: Public biodiversity conservation-related investments, including donor support (NEMA 2014)

Central government support for biodiversity conservation-related activities increased between 2005/6 to 2009/2010 for all the primary categories of agriculture, environment and tourism and wildlife management. Between 2009/10 and 2011/12 a reasonable decline can be observed in Figure 24. Whereas the decline for environment and tourism and wildlife ended after one financial year the decline for agriculture continued for the two years in the analysis. The 2009/2010 financial year expenditure was influenced with consolidating central government resources for elections held at the beginning of 2011. Therefore, it is possible that the decline represented re-allocation of some of the available resources. However, the continued decline for agriculture could have been linked to government's reduced confidence in the largest programme under the sector, the National Agricultural Advisory Services (NAADS).

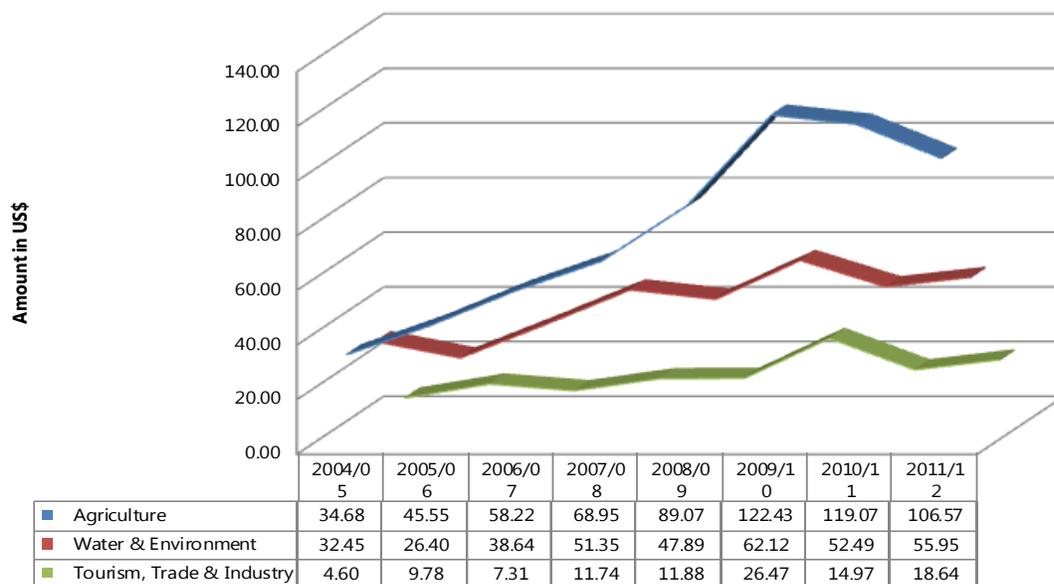


Figure 24: Central government biodiversity conservation-related investment, excluding donor support (NEMA 2014)

A component of public sector investment to biodiversity conservation is through on-budget project support through donor projects. The budget support from donors is shown, in Figure 25, to have decreased from US\$11.2 to US\$4.7 million for tourism and wildlife, unstable with large fluctuations for the environment and natural resources sub-sector and to have increased at first and then stabilized for the agricultural sector investments.

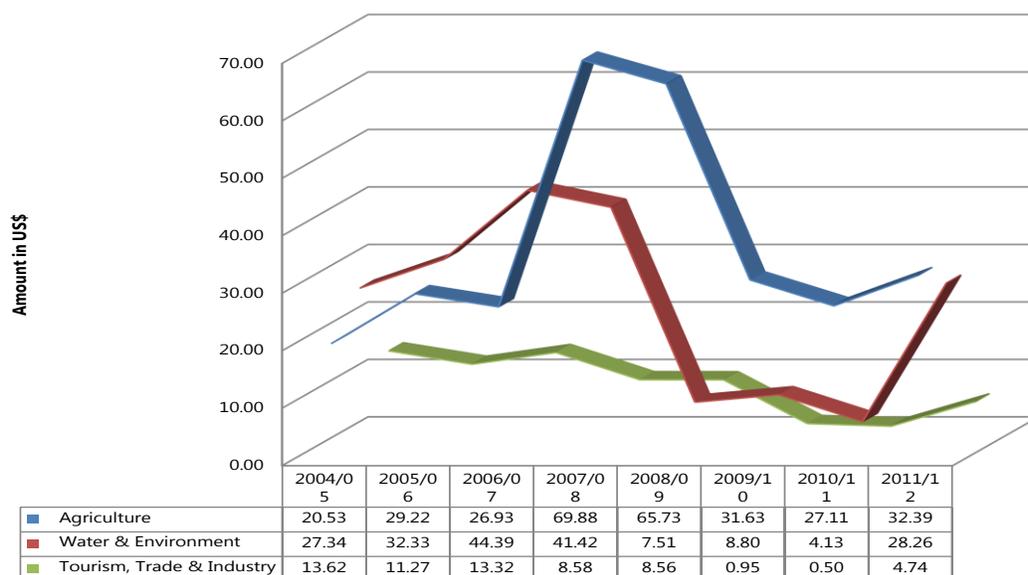


Figure 25: Donor project support to biodiversity conservation-related investments (NEMA 2014)

Donor support: Between 2006 and 2010, Aid allocated to multi-sector cross cutting activities such as environmental management was only 4.2% (US\$266.4 million) (Development Initiative 2012). This is an average of \$53.4 million/ year to environment related sectors. However, it is clear that these calculations include allocations to the water sub-sector and that the allocations to biodiversity conservation activities were not clearly articulated. Since 2006, overseas development assistance (ODA) has supported watershed management, tree planting, protected area management, tourism and climate change activities related to biodiversity conservation among others.

Despite the higher allocation to the agricultural sector, for the core biodiversity conservation investments, a much higher investment is envisaged for the agricultural sector. For instance, the final Budget Call Circular provided an MTEF of \$154 million to the agriculture sector in FY 2013/14; out of the National MTEF of \$5.2 billion representing only 3% allocation to the Agriculture sector. The allocation is well short of the Maputo/ Comprehensive Africa Agriculture Development Program (CAADP) declaration of at least a 10% allocation of the National Budget to the Agriculture sector (MAAIF 2013).

The Ministry of Tourism, Wildlife and Antiquities (MTWA) is assisted by; the Uganda Tourism Board (UTB), the Uganda Wildlife Authority (UWA), the Uganda Wildlife Education Centre (UWEC), the Uganda Wildlife Training Institute (UWTI), and the Hotel and Tourism Training Institute (HTTI). Public sector expenditure, according to the MTEF, on Tourism Trade and Industry Sector is projected at \$20.48 about 0.4% of the national budget. With regards to funding, MTWH was only allocated 0.13% of the government's total FY 2011/12 budget, the government invested only US\$4.5 million (UNDP 2012), even though this was expected to increase to only \$6.66 million in 2013/14 (MFPED 2013). Despite the low investment from central government, national income from Tourism Wildlife and Antiquities increased from \$564million in 2009 to \$662million in 2010 reflecting a 14% increase.

### *Innovative financing mechanisms*

The CBD refers to six strategic financial mechanisms namely payments for ecosystem services, biodiversity offsets, environmental fiscal reforms, markets for green products, international development finance and biodiversity climate change funding. From the study carried out on biodiversity financing the findings so far are highlighted below.

#### **a) Payments for ecosystem services (PES)**

Uganda's experience with these types of PES projects dates back to the early 1990s. However, PES schemes are still limited to small projects. In recent times there has been an effort to scale-up PES options for biodiversity conservation by "developing an experimental methodology for testing the effectiveness of PES to enhance biodiversity conservation in productive landscapes in Uganda" supported by GEF through UNEP. Preliminary indicate that resources mobilized through PES is about US\$2 million per year.

Payments for carbon sequestration, biodiversity conservation and watershed protection services are emerging mechanisms that offer future streams of financing for biodiversity conservation for rural communities. A new approach being piloted in eastern Uganda is establishing financing facilities to that are operable at regional level to offer bridge ex-ante financing for farmers and time for the project developer to successful market ecosystem services.

**b) Biodiversity offsets**

In July 2007, the Government of Uganda entered into an indemnity agreement with the International Development Association (IDA) of the World Bank to support a portion of the financing of the Bujagali Hydropower Project by the IDA/World Bank. Agreement among other things, the Government of Uganda designated Kalagala – Itanda Offset Falls as a biodiversity offset, including the preservation of the Mabira central forest reserve and the Nile Bank central forest reserve. The Kalagala – Itanda Offset set a precedent for international multilateral financing and support towards biodiversity conservation.

**c) Environmental Fiscal Reforms**

- (i) Fiscal policy has also been used in the management of the environment. The environmental levy is charged used vehicles, environmental tax on polythene bags and plastic containers and goods while exemptions from import duty on garbage trucks. It is envisaged that the tax on polythene and plastic containers could lead to switching to the use of paper and other local decomposable local materials, while the tax on old vehicles. The enabling legal and policy framework for the implementation of environmental fiscal reform (EFR) is the National Environment Act Cap 153
  
- (ii) Another set of Environmental Fiscal Reform are measures for Sustainable Fisheries User Levy. These levies are collected from the fish landing site by Beach Management Units, District Fisheries Staff through to the national level by the Directorate of Fisheries Resources and Uganda Revenue Authority. The levies include fishing vessel license, fishing permits, fish monger license, specific fish license, artisanal fish processing license, fish movement permits, fish health certificates, industrial fish processing license.

**National Forestry Authority:** NFA’s budget excluding taxes and arrears has generally remained unchanged. However the government has taken over the wage bill of NFA allocating UGX 3.6 billion this financial year although the nonwage budget has been cut. NFA has set a target of UGX 12.199 billion/year, or approximately \$5 million/year for NTR. This should boost its operations during the financial year

**Uganda Wildlife Authority:** UWA is mandated to ensure sustainable management of wildlife resources and supervise activities related to wildlife protected area management in Uganda. The organization is responsible for the management of 10 National Parks, 12 Wildlife Reserves and provides guidance for the management of 5 Community Wildlife Areas and 13 Wildlife Sanctuaries. In addition UWA is responsible for the management of wildlife outside Protected Areas. Own revenues received by Uganda Wildlife Authority

from recreational Services include revenues; including Chimpanzee viewing, Mt Gorilla tracking, Hiking and Biking, Picnicking, Bat viewing, Nature walks, Lodging and accommodation, aggregated nature walks, Birding, Butterfly viewing, Chimpanzee tracking and Primate walks.

Since 2004/05, non-tax revenues for UWA have grown at an average rate of 12% and the growth has been consistent with the exception of revenue dips in 2005/06, 2007/08 and 2010/11 (Figure 26). The causes of revenue declines have varied from insecurity to structural changes or investments at the highest income earning national parks, Bwindi, Queen Elizabeth and Murchison Falls National Parks. The high NTR has enabled UWA to support conservation of biodiversity in protected areas even though government support has often not exceeded 5%.

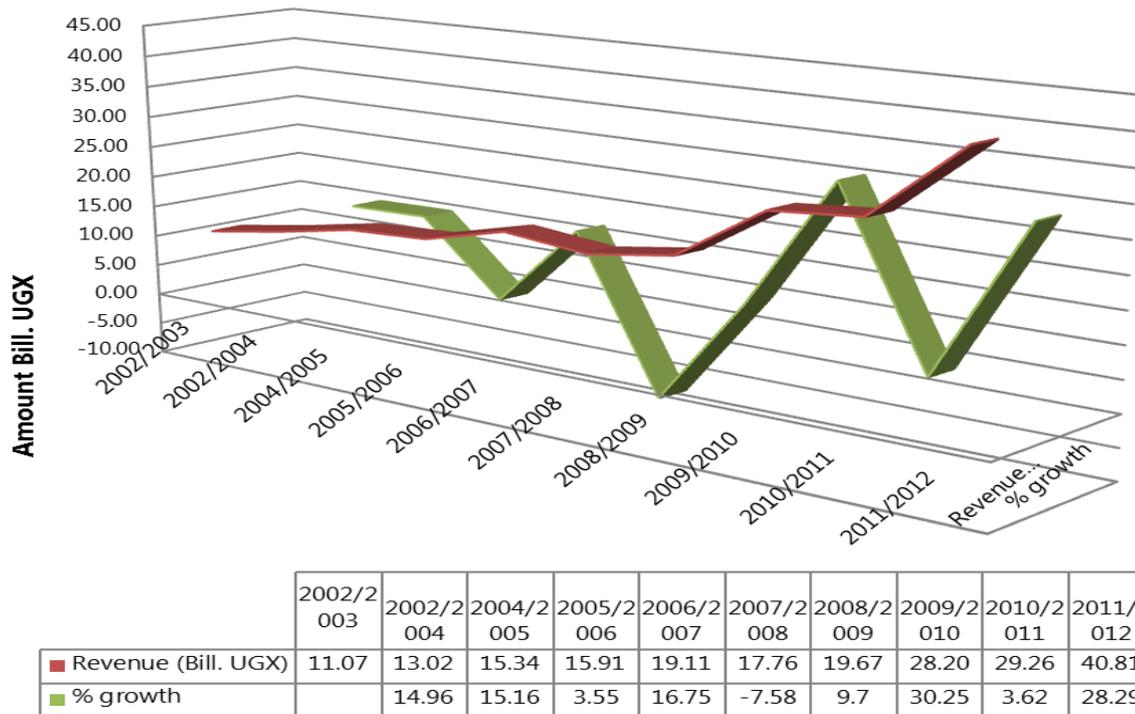
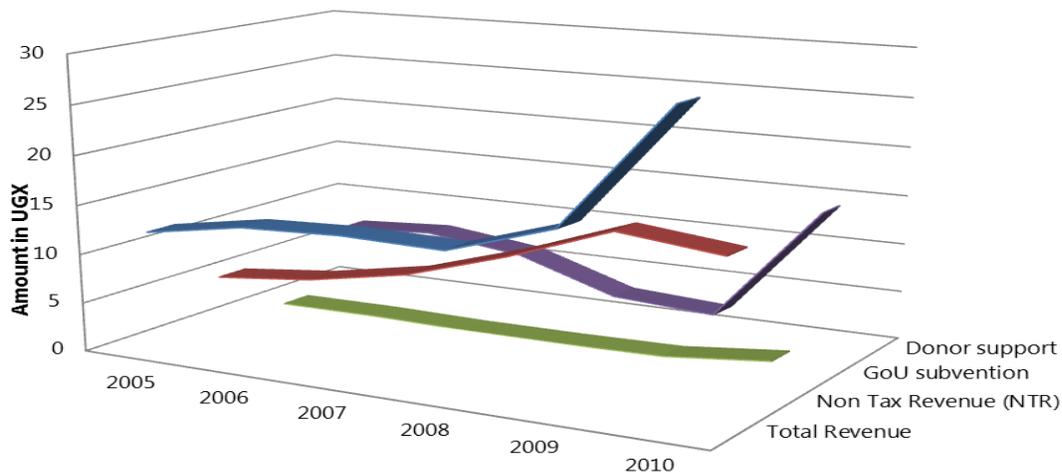


Figure 26: Non-tax revenues generated by Uganda Wildlife Authority and percentage rate of growth (NEMA 2014)

## National Forestry Authority

Between 2005 and 2010, government subventions to the NFA ranged between 0.2 and 1.0% of the revenues generated by the agency (Figure 27). The most consistent source of revenue was non-tax revenue (NTR), which continually to increase from 44% in 2005 to a peak of 87% in 2009 before declining to just under 50% in 2010 as donor support increased. Donor support for the agency was as high as 55% in 2005 decline up to 12% in 2009 before rising again to 48% in 2010. The changes in forestry governance at the national level could have played a strong part in engagement with development partners.



	2005	2006	2007	2008	2009	2010
■ Total Revenue	12.26	13.91	14.3	14.08	17.28	29.32
■ Non Tax Revenue (NTR)	5.42	6.44	8.26	11.34	15.04	13.89
■ GoU subvention	0.164	0.194	0.024	0.042	0.176	1.2
■ Donor support	6.68	7.28	6.01	2.7	2.07	14.03

Figure 27: NFA generated revenues including donor support, NTR and government subvention (NEMA 2014)

**Local revenues:** The principal sources of revenue collected at local government level are local service tax, local government (hotel) tax, property taxes, user fees and others. An error of commission leads to poor attribution of specific sources of revenues. Analyses conducted by the Local Government Finance Commission (MoLG 2011) showed that local revenue collected by local governments increased from Ushs 118.7 billion/year to Ushs 142.8 billion/ year. Although, this was a remarkable improvement of 20% in one financial year, it falls way short of the target Ushs 334.6 billion/year that can be collected. For natural resources depended Districts like Nakasongola District, more than three-quarters of the local revenue is generated from licenses and fees on environment and natural resources such as charcoal, fisheries, timber and sand among others.

#### **d) Markets for green products**

In 2012/13 financial year exports contributes 13.4% of the country's GDP. Total export earnings for the period April 2011 to March 2012 were estimated at US\$2,602.5 million. Coffee exports were highest at US\$466.9 million. Formal non-coffee export earnings were estimated at US\$1,768.8 million, and they include electricity, cotton, tea, fish, hides and skins, beans, flowers, oil re-exports and cobalt as well as gold, tobacco, simsim and maize.

Whereas biodiversity contributes to many of the exports above, deliberate biodiversity conservation efforts associated with the production systems is limited. However, in the mid 1990s, several non-traditional marketing channels emerged for coffee, including organic, fair trade and shade-grown. All were aimed at improving the stability of incomes received by farmers, even though only 0.21 per cent of Uganda's coffee was exported as organic and less than 0.5% as sustainable coffee (including fair trade, organic and shade coffee). The premiums earned by farmers ranged between 22 and 35%

Biodiversity conservation products occurring in and outside protected areas are numerous from non-wood forest products including wildlife coffees, honey, wildlife use products, among others. Continual feasibility assessments are needed as well as value chain assessments to establish viable product and services lines as well as opportunities for creating additional value for primary stakeholders, especially communities.

#### **e) Climate finance**

There is limited climate change finance for biodiversity conservation in Uganda although a number of initiatives integrate biodiversity conservation activities. The Trees for Global Benefits Programme under the Environmental Conservation Trust (ECOTRUST) manages a Plan Vivo standard for carbon farmers in western and eastern Uganda. The farmers undertake afforestation and reforestation activities aimed at restoring or replenishing indigenous trees within the community in turn farmers earn payments on their verified emissions reductions. Similar voluntary carbon projects with elements of biodiversity conservation are managed by the Uganda Wildlife Authority (UWA) with Forests Absorbing Carbon dioxide Emissions (FACE) Foundation in Mt. Elgon and Kibale National Parks and the Nile Basin Reforestation CDM between the National Forestry Authority (UWA) and the World Bank BioCarbon Fund.

Uganda is developing a series of Nationally Appropriate Mitigation Actions (NAMAs). Many of the NAMAs proposed in agriculture, and wastewater management deal directly with biodiversity conservation.

## **f) International development finance**

International development finance instruments supporting biodiversity conservation include development partner support for projects as well specialized adjustments to financing programmes in order to allow for additional resources towards biodiversity conservation. The former, donor support, is categorized as a traditional financing mechanism and the focus often was on integrated development and conservation projects. The United States Agency for International Development (USAID), the World Bank and DFID, among others, were major actors in supporting implementation of environmental policy reforms that led to the establishment of the NEMA, NFA, UWA, among other institutions.

Innovative approaches however, include the International Monetary Fund (IMF), World Bank and Paris Club of Donor countries supported Highly Indebted Poor Countries (HIPC). Under HIPC debt relief was granted to the least developed countries (LDCs) including Uganda. In the case of Uganda the funds that were used for servicing foreign debt were to be redirected to the Poverty Action Fund (PAF).

### *Major Environmental Conservation Trusts*

#### **Bwindi Mgahinga Conservation Trust**

Bwindi Mgahinga Conservation Trust was established in 1994 under the Uganda Trustees Act. The vision of BMCT is to conserve the biodiversity of Mgahinga Gorilla National Park (MGNP) and Bwindi Impenetrable National Park (BINP) in harmony with development needs of the surrounding communities. Primary funding is from the BMCT endowment fund (26%) that was initially set up under the Global Environment Facility through the World Bank in 1994 and other donors who wish to support projects of their own interest that help in the promotion of BMCT Vision and Mission.

#### **Environment Fund**

Section 88 of the National Environment Act (NEA) Cap 153 establishes the Fund to be administered by the NEMA Board and accordingly any decisions regarding expenditures from the Fund are taken by the Board. The sources of the fund shall consist of - (a) disbursements from the Government; (b) all fees charged under this Act; (c) any fees prescribed for any service offered by the authority; (d) any fines collected as a result of the breach of the provisions of this Act or any statutory instrument made under this Act; (e) gifts, donations and other voluntary contributions to the fund made from any source.

#### **Tree Fund**

Section 40 of the National Forestry and Tree Planting Act establishes the Forest Fund to promote tree planting and growing at local and national level and to support tree planting and growing efforts of non-commercial nature which are of benefit to the public. The Tree Fund received one billion Uganda shillings per year, which is considered very little to support the planting of forests in the Country. The Natural Resources Committee of Parliament while reviewing the sector's ministerial policy statement 2013/14 recommended that government increases the funding to the Tree Fund to enable NFA distribute seedlings to communities for tree planting.

### Gaps in biodiversity conservation financing

The financing gap for biodiversity conservation related investments in Uganda is estimated at \$455 million/year; i.e. current financing is \$216 million while \$671 million is required. The largest financing gaps is in the agriculture sector at \$366 million/year, in line with the country's commitments under CAADP, while other gaps cover the other primary sub-sectors of environment and natural resources, and tourism, wildlife and antiquities as well as research (Table 10).

Table 10: Estimated financing gap for biodiversity conservation-related investments (\$/year)

Sectors/sub-sectors	Agencies	Current financing Amount \$/year	Gap in financing	Desired financing Amount \$/year
Environment and Natural Resources	NEMA	Current on budget and off-budget resources have been estimated at \$29.15 million/year (MWE 2013).	The financing gap is then \$36.15 million/year	The first ever ENR Sector Investment Plan (ENR SIP) was done in 2007 for the period 2007/08 to 2017–18. The total budget for the 10-year period was \$653 million. This is equivalent to \$ 65.3 million (MWE 2008)
	NFA			
	CCU			
	Departments of Environmental Support Services (DESS)			
	FSSD			
	Wetlands Management Department			
	Directorate of Meteorology (DOM)			
Agricultural Sector	The Ministry and Directorates of crop resources, animal resources	<b>Agriculture sector</b> - the final Budget Call Circular provided an MTEF of \$154 million to the agriculture sector in FY	Financing gap for the sector is \$366 million/year	Out of the National MTEF of \$5.2 billion representing only 3% allocation to the Agriculture sector. At least \$520 million/ year is the sustainable investment proposed for
	<u>Plan For Modernisation of Agriculture Secretariat (PMA)</u>			
	<u>Control of Trypanosomiasis in</u>			

Sectors/sub-sectors	Agencies	Current financing Amount \$/year	Gap in financing	Desired financing Amount \$/year
	<u>Uganda (COCTU)</u> <u>Dairy Development Authority (DDA)</u> <u>National Genetic Resource Centre and Databank (NAGRC&amp;DB)</u> <u>Cotton Development Organisation (CDO)</u> <u>Uganda Coffee Development Authority (UCDA)</u> <u>National Agricultural Research Organisation (NARO)</u> <u>National Agricultural Advisory Services (NAADS)</u>	2013/14; Including invest in research under NARO		the sector
Tourism, Wildlife and Antiquities	Tourism Services Uganda Wildlife Authority Uganda Wildlife Education Centre Uganda Tourism Board Ngamba Island Chimpanzee Sanctuary and Wildlife Conservation Trust	Approximately \$32.68 million with about \$ 20.4 million for UWA.	Financing gap is about \$52.32 million/year	Currently the tourism, wildlife and antiquities sub-sector contribute about \$1.7 billion as national income. It has been that a re-investment of at least 5% would support sustainable ecosystem management i.e. \$85 million/year

<b>Sectors/sub-sectors</b>	<b>Agencies</b>	<b>Current financing Amount \$/year</b>	<b>Gap in financing</b>	<b>Desired financing Amount \$/year</b>
	Uganda Wildlife Training Institute			
	Hotel & Tourism Training Institute			
Others	Uganda National Council of Science and Technology and Universities	Current investment estimated as \$0.04 million, excluding NARO	The financing gap is about \$0.36 million/year	Approx. \$0.4 million based on Science Technology and Information Report (UNCST 2012)
<b>Total</b>		<b>215.77</b>	<b>454.93</b>	<b>670.70</b>

(NEMA 2014)

*Outcomes of the study*

- a) Information was used to provide a report to the CBD Secretariat on the progress of resource mobilization in Uganda
- b) The guidelines and actions plan will address the significant financial barriers to effective implementation of the NBSAP. It will establish appropriate guidance to enable mobilization for implementation of NBSAP
- c) Information gathered from the study was used to calculate the financial gaps in biodiversity financing to help Government in scaling up financing for biodiversity in Uganda
- d) Uganda hosted the Africa regional workshop on Resource Mobilization in Entebbe from 11-13 February 2014. Uganda shared its experience on resource mobilizing during the same
- e) Uganda is to receive support UNDP global project on Biodiversity Finance Initiative – BIOFIN, which is seeking to address the biodiversity finance challenge in a comprehensive manner through building a sound business case for increased investment in the management of ecosystems and biodiversity, with a particular focus on the needs and transformational opportunities at the national level.

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## ANNEXE 1 PROGRESS OF IMPLEMENTATION OF AICHI TARGETS AND MDGS

No	Aichi target	Corresponding national biodiversity target(s)	National action taken	Outcomes achieved	Overall rating	Assessment of progress	Indicators used for measurement	Relevant cases
1.	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	By 2018, at the latest, people are aware of the values of biodiversity and the steps they can take to use it sustainably	Awareness and education on biodiversity issues among various stakeholders.  Sharing biodiversity information through the National CHM ( <a href="http://www.chm.nemaug.org">www.chm.nemaug.org</a> )	Attitudinal/behavioral change towards biodiversity conservation and sustainable use.	Very effective/ biodiversity reporting  Incorporation of biodiversity in the curriculum  Education for Sustainable Development Policies and Strategies.	Moderate (Still a segment of the population especially the informal ones and the private sector have not been reached out).	Number of conservation initiatives arising from awareness	Commemoration of International days related to biodiversity.  Mainstreaming of biodiversity into the school curricula
2.	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems	By 2020, at the latest, biodiversity values have been integrated in strategies and plans for development, economic growth and wealth creation, and are being incorporated into national accounting and reporting systems, as appropriate.	Sustainable Development Forum established  Valuation studies of ecosystems services undertaken	Government prioritization of biodiversity conservation during budget allocation and national planning.  Increased funding of decentralized management of natural resources by 5%  Increased financing and investment for biodiversity conservation  Biodiversity values reflected in national accounts and planning processes	Not yet as the results have not yet been communicated.	Minimal progress. (Valuations have been done on a few ecosystems and still ongoing  Progress still low	Increased financing and investment for biodiversity conservation  Biodiversity values reflected in national accounts and planning processes	Valuation studies on protected areas and wetlands  Provide for mechanisms for Green Accounting  Propose economic-ecological models for biodiversity conservation planning and financing.
3.	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation	1. By 2020, incentives harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts.	Project on PES for protection of private forests  Green procurement policy under development	Private Forest Owners engaged in conservation of their forest rather conversion to agriculture	Effective	Demonstrated that local communities can engaged in conservation of private forest on their land if given incentives to do so  Medium. Sustainability of the project beyond GEF	Trends in timber private forest owners engaged in sustainable use of forest on their land	Testing Effectiveness of PES in productive landscapes in Uganda

	and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions	<p>2. By 2020, positive incentives for the conservation and sustainable use of biodiversity are developed and applied, taking into account national socio-economic conditions.</p> <p>3. Complete and pass the green procurement policy by 2016.</p> <p>4. Train at least 900 procurement practitioners in green procurement procedures by 2019</p> <p>5. Train the pre-qualified providers of government entities in the 3Rs (Reduce, Reuse and Recycle) 2019</p>				support is the major challenged		
4.	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources	<p>By 2020, at the latest, Governments, the private sector and stakeholders at all levels have put in place and implemented measures to achieve sustainable production and consumption within safe ecological limits</p> <p>By 2020, the Government with the</p>	Promotion of Cleaner Production Technology	<p>Use of technology that minimizes waste by the private sector (industries)</p> <p>Use of EIA for projects that are likely to have adverse impacts on biodiversity</p>	Very effective	<p>For Cleaner production technology, the impact is still low but is likely to increase with more awareness</p> <p>For EIA the impact is high. All projects that may have adverse impact on biodiversity is subjected to EIA Biodiversity issues</p>	<p>Trends in industries using cleaner production technologies</p> <p>Trends in private sector undertaking EIAs</p> <p>Trends in compliance to mitigation measures in the EIA certificate</p>	Establishment of effluent treatment plants by industries

	well within safe ecological limits	participation of business and other relevant stakeholders at all levels has instituted measures towards the achievement of or has implemented plans for sustainable production and consumption and has limited the impacts of use of natural resources on the environment.				planned and budgeted for at National and Local levels  Trends in actual release for biodiversity conservation realized		
5.	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced	By 2020, the rate of loss of all natural habitats including forests, is at least halved and where feasible is brought close to zero, and degradation and fragmentation is significantly reduced.  By 2020, restoration plans and measures are in place for all depleted species are in place	Enrichment planting and restoration of degraded forest areas  Promoting tree planting to reduce pressure on natural forests	Increasing number of individuals and the private sector engaging in tree planting	Effective	Moderate	Trends in the number of individuals and private sector involved in tree planting  Trends in the number of forests restored  Trends in area of forests (ha) restored	Tree planting initiatives supported by SPGS
6.	By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries	By 2020, all fish and invertebrate stocks are managed and harvested sustainably, restoration plans and measures are in place for all depleted species, the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits, e.g. Nile Perch, Tilapia  By 2020, all fish stocks are managed and harvested sustainably	Strategies put in place to address the challenges of illegal fishing	Reduction in illegal fishing activities and recovery of fish stocks	Effective. Frequent monitoring is vital	Moderate. More areas need to be covered	•Trends in illegal in fishing  •Trends in the use of destructive fishing methods and gears  Trends in the number of Fisheries Management and restoration plans developed and implemented  Trends in the number and areas of wetland restoration plans developed and implemented  Trends in the number of invasive aquatic management	Strengthening of fisheries co-management  Restocking of lake Victoria and L. Kyoga with native fish species

	on stocks, species and ecosystems are within safe ecological limits	By 2020, the impacts of fisheries activities on stocks, species and ecosystems are within safe ecological limits, e.g. Nile Perch, Tilapia  By 2020, the multiple anthropogenic (human) pressures on fragile ecosystems impacted by climate change are minimized so as to maintain their integrity and functioning					plans developed and implemented  Trends in fish catch rates (Catch per Unit Effort - CPUE )	
7.	By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity	By 2020, management plans are in place for areas under forest to ensure sustainable biodiversity conservation	Development of forest management plans  Promoting aquaculture  Mainstreaming biodiversity conservation in agricultural sector	Zoning of forests into different management zones  More individuals getting involved in aquaculture because of the economic benefit that accrues from it  Plant Genetic Resource Centre carry out documentation and preservation of seeds of threaten species in the wild	Effective	Moderate. Implementation of management plans limited by inadequate resources – human and financial	Trends in budget allocation for aquaculture development  Trends in production of fish seeds and feeds  Trends in aquaculture husbandry  Trends in area of agricultural land under sustainable management  Trends in area of forests under sustainable management  Trends in the number management plans developed and implanted  Trends in the number of farmers trained in aquaculture husbandry practices	Forests under collaborative management
8.	By 2020, pollution,	By 2020, pollution	Assessment of pollution	Information used to guide	Not very effective	Moderate: Resources for		

	including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity	including from excess nutrients will have been to levels that are not detrimental to ecosystem functions and biodiversity (all pollution parameters including BOD, CODs, PAHS, POPs, heavy metals among others)	in Inner Murchison Bay on the northern shores of L. Victoria  Baseline survey of L. Albert ecosystem prior to commencement of oil production	decisions on intervention to reduce pollution in the inner Murchison Bay  Development of Water Quality Monitoring Guidelines		implementation of activities inadequate	Trends in pollution levels due to various anthropogenic practices such agriculture, waste water, oil and gas development activities are compliant with national and international standards	
9.	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment	By 2020 measures for control invasive alien species instituted and implemented	National Invasive Species Strategy and Action Plan developed  List of priority IAS in need of control identified	Institutional framework for management if IAS in place	Fairly effective	Low: Implementation of NISSAP hampered by lack of financial resources	Trends in the abundance and geographical coverage of selected IAS  Trends in the number of invasive aquatic management plans developed and implemented  Trends in economic cost or investment in the management or control of IAS  All invasive species and pathways identified, prioritized and controlled by 2020  Trends in the number of management plans developed and implemented	Project on removal of barriers for effective management of IAS  Control of water hyacinth
11.	By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably	By 2020, at least 17% of terrestrial and inland water, especially areas of particular importance for biodiversity and ecosystem services are conserved through effective and equitable ecologically representative and connected management of	Rationalization of protected area	Management of protected areas improving	Effective	Moderate.	Trends in percentage coverage of protected areas to the countries total land area  Area of inland aquatic systems gazette and effectively managed  Trends in number and area of corridors connecting protected areas)	Study on governance of protected areas

	managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	protected areas.						
12.	By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained	By 2020, the extinction of threatened species has been prevented and their conservation status improved	Protection of threaten species	Species recovery	Effective	Moderate	Trends of species population  Trends in the number of Species Management Plans developed and implemented  •Change in status of threatened species  Number of previously extinct species re-introduced	Protection of the shea butter trees  Re-introduction of the white rhino
13.	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other social economically and as well as culturally valuable species, is maintained and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity  By 2020, 30% of the genetic diversity of main crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge	Documentation of important plant genetic resources that under threat and in need of protection	Preservation of seeds and specimen at Plant Genetic Resource Centre and Animal Genetic Resource Centre	Effective	Moderate	Trends of genetic diversity of cultivated plants and domesticated animals	Study on the role of IK and Practices in the conservation of medicinal plants

		<p>By 2020, Indigenous and local knowledge innovations and practices associated with plant genetic resources documented, maintained or improved as appropriate, to support customary use, sustainable livelihoods, local food security and health care</p> <p>By 2020 at least 2 partnerships established to ensure that wild harvested plant-based products are sourced sustainably</p> <p>By 2020, the importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes</p> <p>By 2020 network of community based plant genetic resources management initiatives established</p> <p>A well established framework for implementing the Multilateral System of</p>						
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		accessing and benefit sharing of benefits arising from access and use of PGR BY 201						
14.	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable	<p>Critical ecosystems identified and mapped by 2018</p> <p>Identified ecosystem services valued by 2017</p> <p>15 % of identified degraded ecosystems restored by 2020</p> <p>Safeguard 30% of the ecosystems by 2020</p> <p>Needs of women, indigenous and vulnerable mainstreamed in the NDP by 2016/17 FY</p>	Carrying out restoration of degraded ecosystems that provide vital ecosystem services	Vital ecosystem services restored in degraded areas	Effective	Moderate	Trends in the areas of degraded ecosystems restored.	Restoration of degraded wetlands and forests

15.	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification	<p>By 2018, Biodiversity issues fully integrated into the National REDD+ program</p> <p>Maintain 5% of the identified National carbon stocks and storage ecosystems' integrity by 2020</p> <p>Restore at least 5% of the degraded CFRs and 2% of local forest reserves by 2020</p> <p>At least 15% of the communities living in biodiversity hotspots appreciate the role of biodiversity conservation in weather, climate, climate change and livelihood by 2019</p> <p>At least 10% of all relevant institutions have the capacity to monitor and evaluate the impacts of cc on biodiversity, ecosystems and ecosystem services by 2020</p>	Mainstream biodiversity in Red Readiness Preparedness Proposal	Inclusion of biodiversity REDD+ interventions	Effective	Moderate	<p>Trends in areas of degraded ecosystems that have been restored</p> <p>Trends in number and areas covered by Ecosystem based Adaptation activities</p> <p>Trends in the areas of ecosystems that important carbon stocks</p>	<p>The national REDD+ program</p> <p>EBA project in the Mount Elgon Ecosystem</p>
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16.	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is acceded to by Government.  Review of the National Environment (Access to Genetic Resources and the Fair and Equitable Sharing of Benefits) Regulations of 2005 to take into account the Nagoya Protocol by 2017	Lobby for Government accession to the Protocol	Approval by Parliamentary Committee on Agriculture, Science and Technology and ENR  Approval by the Attorney General	Effective. Accession to the Protocol expected by or before 1 <sup>st</sup> June 2014	Moderate.	Cabinet paper for accession prepared,  No objection Attorney General and Financial Clearance by Ministry of Finance  Date of accession to the Nagoya Protocol on ABS  National Environment (Access to Genetic Resources and the Fair and Equitable Sharing of Benefits) Regulations revised Improved regulatory to address gaps and align it to the Nagoya protocol on ABS	SWOT analysis of National ABS regulations  Assessment of institutional capacities for implementation of regulations on ABS
17.	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan	By December 2014 NBSAP reviewed, updated and presented for adoption by cabinet.  By 2015 an Monitoring and Evaluation strategy for the implementation of NBSAP developed	Review and update NBSAP	National targets developed within the frame work of the Aichi targets  Other emerging issues such as oil and gas, climate change included in the revised NBSAP	Effective	High	Date of approval/adoption of the revised and updated NBSAP	NBSAP review and updating process
18.	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are	By 2017 IK, TK and community participation integrated into the conservation and biodiversity at all levels	Undertake a study on the role of IK and Practices in the conservation of Medicinal Plants	Recommendations on how to further promote IK and practices that are important for conservation of medicinal plants	Effective	Moderate	IK integrated in the conservation and management of biodiversity at the national and local level  Trends in the number of groups and communities whose IK and TK, respectively, have been integrated in the NBSAP implementation	Report of the study on role of IK and practices in conversation of medicinal plants

	respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels						Trends in the number of access and benefit sharing arrangements with the indigenous communities	
19.	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied	<p>By 2020,</p> <p>Basic taxonomic information is packaged in user-friendly formats and widely disseminated, including use of school systems</p> <p>The importance of taxonomy is mainstreamed in key development sectors and employment of taxonomists done in lead agencies</p> <p>By 2018, biotech tools (molecular markers, genetic bar coding ,etc)in the identification, characterization and conservation of biodiversity developed and applied</p> <p>By 2018, public Awareness, Education &amp; participation in Biotechnology and Biosafety are enhanced</p> <p>Mechanisms for continuous Human and Infrastructural Resource Capacity Development,</p>	<p>Carry out a study on taxonomy capacity needs for Uganda</p> <p>Assess the status of biotechnology and Biosafety in Uganda</p> <p>Lobby for Government accession to , the Nagoya –Kuala Lumpur Supplementary Protocol on Liability and Redress</p>	<p>Awareness on relevance and role of taxonomy in production sectors enhanced</p> <p>Sharing and application of taxonomic information in biodiversity conservation planning improved</p> <p>Biotechnology harnessed for the conservation of biodiversity</p> <p>Improved usage of taxonomic information for biodiversity conservation</p> <p>Approval by Parliamentary Committee on Agriculture, Science and Technology and ENR</p> <p>Approval by the Attorney General</p>	Effective.	Moderate	<p>Trends in the adoption of biotechnology for national development</p> <p>Fully functional National Biosafety System</p> <p>Trends in compliance with national and international requirements</p> <p>Regulatory framework on Liability and Redress</p> <p>Date the of accession to Nagoya –Kuala Lumpur Supplementary Protocol on Liability and Redress under the Cartagena Protocol</p>	<p>Report of Taxonomy capacity needs assessment in Uganda</p> <p>Report on status of biotechnology and Biosafety in Uganda</p> <p>National targets for biotechnology and Biosafety set and included in NBSAP2</p>

		<p>deployment and retention</p> <p>Promulgate legislation on Biotech and Biosafety by 2016</p> <p>By 2015, the Nagoya –Kuala Lumpur Supplementary Protocol on Liability and Redress under the Cartagena Protocol on Biosafety is acceded to by Government</p> <p>Incorporate issues on liability and redress in the draft Biotechnology and Biosafety Bill</p>						
20.	<p>By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties</p>	<p>By 2014, study undertaken in respect of CBD Decision X/3 and guidelines for financing biodiversity in Uganda developed</p> <p>By 2017 financial resources for effectively implementing the NBSAP increased by at least 5% of the current level.</p>	<p>Carry out a study on financing biodiversity was commenced in November 2012 and ends in April 2013.</p>	<p>Guidelines and Action Plans for Financing Biodiversity</p> <p>Financial gaps for conservation of biodiversity established and will form the basis for advocating for increasing financing biodiversity in Uganda</p>	Fairly effective	<p>Moderate. A lot of lobbying is needed to get the resources needed to address the financial gaps for biodiversity conservation</p>	<p>Trends of financial resource investment in biodiversity conservation</p>	<p>Guideline and action plan for financing BC</p>

MDAs – Ministries, Departments and Agencies

## ANNEX 2: TECHNICAL COMMITTEE ON BIODIVERSITY CONSERVATION

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## **ANNEX 3: THEMATIC WORKING GROUP FOR THE REVIEW AND UPDATING OF NBSAP**

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## APPENDICES

### **Appendix I: Process used to prepare the 5th National Report**

Decision X/10 of the CBD decided that Parties to the Convention submit their Fifth National Report by 31st March 2014. In this regard, guidelines for the preparation of the Fifth National Report were adopted. Uganda received financial support from the GEF through UNEP to develop its Fifth national Report. The process was coordinated by the CBD National Focal Point for Uganda. Overall technical guidance was by the Technical Committee on Biodiversity Conservation. The preparation was undertaken by a Working Group unlike national reports which were prepared by consultants.

The preparation of the Fifth National Report for Uganda was carried out concurrently with the review and updating of the National Biodiversity Strategy and Action Plan (NBSAP). The information that was generated from the stock-taking of baseline information for the review and updating of NBSAP was used to prepare the Fifth National Report for Uganda. The stocking was carried out by a Thematic Working Group (TWG) from Government Ministries, Departments and Agencies (MDAs), academia and research institutions, representative from the private sector (Total Uganda) and NGOs. TWG composed of experts in different fields including scientists, lawyers, economists, statisticians, planners and accountants among others. This was done because biodiversity is cross cutting and information is needed from different stakeholders.

Terms of Reference for the TWG were designed to include capturing information that would feed into the preparation of the Fifth National Report. Hence the guidance provided in Decision X/10 was used in developing the TORs for the TWG. The key issues raised in the three main parts of the Fifth National report contained in the guidance from decision X/10 for preparation of the Fifth National Reports were captured in the TOR for the TWG. The information generated was not only used to inform the review and updating of NBSAP, but also for preparation of the Fifth National Report.

A Working Group was constituted to undertake the preparation of the Fifth National Report on behalf of NEMA, the institution that coordinates implementation of the CBD. Guidance to the Working Group was by the CBD National Focal Point on behalf of NEMA. In order to ensure that the working group carried out their work properly, the CBD National Focal Point made presentations on the process for preparation of the Fifth National Report prior to the group beginning its work. The presentations covered the following:

- a) Guidelines for preparation of the Fifth National Report adopted in decision X/10;
- b) A brief on the outcomes of the first regional workshop for the African Least Developed Countries on the preparation of the Fifth National Report and the Global Biodiversity Outlook that took place in 18th February – 1st March 2013 in Nairobi Kenya;

- c) Draft TORs for the working group;
- d) Draft road map for preparation of the Fifth national Report; and
- e) Draft provisional outline for the Fifth National Report

The Working Group began its work by reviewing and approving the TORs, the road map and the provisional outline for the Fifth National Report. The provisional outline and the road map were shared with the CBD Secretariat and UNEP and they provided comments that were used to streamline the outline. The Working Group was divided into three groups as follows:

- (a) Biodiversity status, trends, and threats and implications for human well being
- (b) The national biodiversity strategy and action plan, its implementation, and the mainstreaming of biodiversity
- (c) Progress towards the 2020 Aichi Biodiversity Targets and contributions to the relevant 2015 Targets of the Millennium Development Goals

In order to ensure continuity and also to use the capacity that had already been built in the TWGs, members of the Working Group for the preparation of the Fifth National Report were drawn from TWG. The advantage with this is that members of the working group had participated in the stock-taking and were more knowledgeable about the report and this expedited extracting information in those reports to populate the various sections of the Fifth National Report using the outline that had been agreed upon.

The other advantage of selecting members of the working group from TWG was in the assessment of progress towards the achievement of the Aichi targets at the national level. Capacity of members of TWG had been built on the Aichi targets which guided them in setting national targets with the framework of the Aichi targets. Since members of the working group were from the TWGs and had participated in the setting of national targets, they were better informed in assessing progress towards the achievement of the Aichi targets at the national level.

The working group met twice during which progress reports were received, presented and discussed among members to identify gaps and how to address them. Beyond the meetings, members of the group continued to work through e-mails coordinated by the team leaders. Additional available literature was posted on the National Clearing House Mechanism (CHM) for Uganda for members to download. Linkages to other sources of information or data were provided by the CHM website.

The draft report of the working group was presented at a national stakeholder's validation workshop in November 2013. Comments received were addressed and the revised report was submitted to the CBD National Focal Point who in turn circulated to the Technical Committee on Biodiversity Conservation for final technical input. Inputs received from the Technical Committee on Biodiversity Conservation were incorporated into the report. Editing of the report was carried out by an editorial team and thereafter the report was submitted to the CBD Secretariat.

Some lessons learnt from using working groups rather a consultant to prepare the Fifth National Report include:

- (a) Ownership of the national report by stakeholders is limited when prepared by a consultant. Stakeholders tend to look it as work of the consultant
- (b) Sharing of information among stakeholders is enhanced when they are directly involved in preparing the National Reports than when they have to provide such information a consultant.



## **Appendix II: Other National Reports website linkages**

[www.chm.nemaug.org](http://www.chm.nemaug.org)

ACODE- <http://www.acode-u.org>

Environmental Alert (EA)- <http://www.ervalert.org/>

Fisheries Training Institute (FTI) Entebbe.- <http://www.agriculture.go.ug/index-page-training-id-272.htm>

<http://dspace3.mak.ac.ug/xmlui/handle/10570/913>

[http://library.nilebasin.org/index.php?option=com\\_phocadownload&view=section&id=7&Itemid=30](http://library.nilebasin.org/index.php?option=com_phocadownload&view=section&id=7&Itemid=30)

[http://pdf.usaid.gov/pdf\\_docs/PNACL744.pdf](http://pdf.usaid.gov/pdf_docs/PNACL744.pdf)

<http://www.caes.mak.ac.ug>

<http://www.fao.org/docrep/003/W3641E/W3641E15.htm>

[http://www.foodnet.cgiar.org/scrip/docs&databases/ifpristudies\\_ug\\_nonscrip/pdfs/more\\_reports/](http://www.foodnet.cgiar.org/scrip/docs&databases/ifpristudies_ug_nonscrip/pdfs/more_reports/)

<http://www.naturetrust.bc.ca/land-conservation/biodiversity/why-is-biodiversity-important/>

<http://www.nilebasin.org/newsite/attachments/article/>

<http://www.thetaug.org>

<http://www.webmeets.com/files/papers/>

<http://www.worldlakes.org/lakedetails>

Integrated Rural Development Initiatives (IRDI). - <http://www.irdiuganda.org/>

Makerere University – [www.mak.ac.ug](http://www.mak.ac.ug)

Makerere University Biological Field Station Kibale National Park (MUBFS).

Ministry of Water & Environment - <http://www.mwe.go.ug/>

National Biodiversity Data Bank- <http://www.nbdb.mak.ac.ug>

National Forestry Authority (NFA)- <http://www.nfa.org.ug>

Nature Uganda - <http://www.natureuganda.org>

THETA (Traditional and modern Health Practitioners Together against Aids and other diseases)

Uganda Biodiversity Information Facility (UgaBIF)- <http://www.ugabif.go.ug/>

Uganda Investment Authority (UIA). - <http://www.ugandainvest.go.ug>

Uganda National Academy of Science (UNAS). - <http://www.ugandanationalacademy.org>

Uganda National Council of Science and Technology (UNCST). - <http://www.uncst.go.ug>

Uganda Wildlife Authority (UWA) - <http://www.ugandawildlife.org/>

Uganda Wildlife Education Centre- (UWEC). - <http://uweczoo.org/>

Wildlife Clubs of Uganda (WCU). - <http://www.wildlifeclubs.org/>

Zonal Agricultural Research and Development Institutes (ZARDIs) - <http://www.muzardi.go.ug/>