

PREAMBLE

This National Water Development Report (**NWDR, 2005**) is a comprehensive report that gives a broad overview of status of the water sector in Uganda and the progress made by government to address the challenges related to sustainable water resources management and efficient provision and delivery of water for different uses.

Preparation of this report was a collaborative effort between the Directorate of Water Development and the World Water Assessment Program (WWAP), which provided both technical and limited financial support.

WWAP is a United Nations (UN) programme bringing together 24 UN agencies to produce a triennial global evaluation of the world's freshwater resources and their management. Under this initiative, WWAP will be publishing a series of World Water Development Report (WWDR) every three years. The first report (WWDR I) was released in March 2003 and the second report (WWDR II) is under preparation and is planned to be released in March 2006. Five African countries were selected as case studies during the preparation of the WWDR II i.e. Uganda, Mali, Kenya, South Africa, Ethiopia.

The National Water Development Reports prepared by each case study country are meant to provide some useful practical experience and lessons to be captured in the preparation of the WWDR II. In addition, summaries of the case study reports will be published in the case study section of the WWDR II. This is a very unique opportunity for Uganda to share its experience in the water sector with the international community!

Preparation of the report was a collective effort of a National Working Group (NWG) comprising of several experts from different government institutions and agencies including: Directorate of Water Development; National Environment Management Authority; Ministry of Agriculture, Animal Industries and Fisheries; Ministry of Energy and Mineral Development; National Water and Sewerage Corporation; Ministry of Health; Ministry of Education and Sports; Wetlands Inspection Division; and the Meteorological Department. Details of the members of the NWG and their respective roles are given in **Tables A.6** in **Annex A**.

The report is a result of a highly consultative process, which involved several stakeholders and interested parties. The report preparation process involved extensive consultations at both national and local levels, collection of information and data, and holding of a number of consultative and brainstorming meetings, seminars and workshops.

The report comprises of 12 Chapters and is structured into three broad sections as follows:

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Section 1 gives general socio-economic information about Uganda, presents an overview of Uganda's Water sector, and highlights the state of Uganda's Freshwater resources.

Section 2 discusses the major socio-economic uses of water including: Rural Water and Sanitation; Urban Water and Sanitation; Water for Food Security; Water for Energy; and Water for the Environment.

Section 3 discusses the broad water management challenges including Water Education, Research and Capacity Building; Valuing Water; and Coping with Water-related Disasters.

LIST OF ABBREVIATIONS AND ACRONYMS

AHA	<i>Asset Holding Authority</i>
BOD	<i>Biological Oxygen Demand</i>
CAO	<i>Chief Administrative Officer</i>
CBO	<i>Community Based Organizations</i>
CIDA	<i>Canadian International Development Agency</i>
COM	<i>Council of Ministers</i>
CSD	<i>Commission for Sustainable Development</i>
CWP	<i>Country Water Partnership</i>
DANIDA	<i>Danish International Development Agency</i>
DC	<i>District Council</i>
DEO	<i>District Environmental Officer</i>
DEAP	<i>District Environmental Action Plan</i>
DfID	<i>Department for International Development – U.K</i>
DWD	<i>Directorate of Water Development</i>
DWO	<i>District Water Officer</i>
EAC	<i>East African Community</i>
ECWSP	<i>Eastern Centers Water and Sanitation Project</i>
ELA	<i>Environmental Impact Assessment</i>
ERA	<i>Electricity Regulatory Authority</i>
EU	<i>European Community</i>
FAO	<i>Food and Agricultural Organization</i>
GDP	<i>Gross Domestic Product</i>
GEF	<i>Global Environmental Fund</i>
GIS	<i>Geographical Information System</i>
GTZ	<i>German Technical Cooperation</i>
GoU	<i>Government of Uganda</i>
HEP	<i>Hydroelectric Power</i>
HRD	<i>Human Resource Development</i>
IDA	<i>International Development Agency</i>
IDPs	<i>Internally Displaced Persons</i>
IHP	<i>International Hydrological Program</i>
ILM	<i>Integrated Land Management</i>
IGAD	<i>Inter-Governmental; Authority on Development</i>
IUCN	<i>International Union for the Conservation of Nature</i>

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<i>IWRM</i>	<i>Integrated Water Resources Management</i>
<i>LC</i>	<i>Local Council</i>
<i>LG</i>	<i>Local Government</i>
<i>LGDP</i>	<i>Local Government Development Program</i>
<i>LVDP</i>	<i>Lake Victoria Development Program</i>
<i>LVEMP</i>	<i>Lake Victoria Environmental Management Programme</i>
<i>MAAIF</i>	<i>Ministry of Agriculture, Animal Industries and Fisheries</i>
<i>MDG</i>	<i>Millennium Development Goals</i>
<i>MEMD</i>	<i>Ministry of Energy and Mineral Development</i>
<i>MOLG</i>	<i>Ministry of Local Government</i>
<i>MoES</i>	<i>Ministry of Education and Sports</i>
<i>MIS</i>	<i>Management Information System</i>
<i>MoH</i>	<i>Ministry of Health</i>
<i>MTEF</i>	<i>Medium Term Expenditure Framework</i>
<i>MWLE</i>	<i>Ministry of Water, Lands and Environment</i>
<i>NBI</i>	<i>Nile Basin Initiative</i>
<i>NELSAP</i>	<i>Nile Equatorial Lakes Subsidiary Action Program</i>
<i>NEMA</i>	<i>National Environment Management Authority</i>
<i>NGO</i>	<i>Non-Government Organization</i>
<i>NWSC</i>	<i>National Water and Sewage Corporation</i>
<i>NGWD</i>	<i>National Ground Water Data Base</i>
<i>PEAP</i>	<i>Poverty Eradication Action Plan</i>
<i>QA</i>	<i>Quality Assurance</i>
<i>RGC</i>	<i>Rural Growth Center</i>
<i>RUWASA</i>	<i>Rural Water and Sanitation East Uganda Project</i>
<i>RWSD</i>	<i>Rural Water Supply Department</i>
<i>RWSS</i>	<i>Rural Water Supply and Sanitation</i>
<i>SIDA</i>	<i>Swedish International Development Agency</i>
<i>SIP</i>	<i>Strategic Investment Plan</i>
<i>SIP 15</i>	<i>Sector Investment Plan for RWSS 2000 -2015</i>
<i>SWRMD</i>	<i>Support to Water Resources Development Department</i>
<i>TAC</i>	<i>Technical Advisory Committee</i>
<i>TC</i>	<i>Technical Committee</i>
<i>TECCONILE</i>	<i>Technical Committee for the promotion of the Development and Environmental Protection of the Nile Basin</i>
<i>TLU</i>	<i>Total Tropical Livestock Units</i>
<i>ToR</i>	<i>Terms of Reference</i>
<i>TPC</i>	<i>Technical Planning Committee</i>
<i>TSU</i>	<i>Technical Support Unit</i>
<i>UK</i>	<i>United Kingdom</i>
<i>UMD</i>	<i>Uganda Meteorological Department</i>

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UNDP	<i>United Nations Development Programme</i>
UNESCO	<i>United Nations Education, Science and Cultural Organization</i>
USA	<i>United States of America</i>
USD	<i>United States dollar</i>
USH	<i>Uganda Shilling</i>
UWASNET	<i>Uganda Water and Sanitation Network of NGO's</i>
UWSD	<i>Urban Water Supply Department</i>
UWSS	<i>Urban Water Supply and Sanitation</i>
WAP	<i>Water Action Plan</i>
WID	<i>Wetland Inspection Division</i>
WRAP	<i>Water Resources Assessment Project</i>
WfP	<i>Water for Production</i>
WPC	<i>Water Policy Committee</i>
WPU	<i>Water Permit Unit</i>
WRM	<i>Water Resources Management</i>
WRMD	<i>Water Resources Management Department</i>
WRMS	<i>Water Resources Management Study</i>
WSPS	<i>Water Sector program Support</i>
WSRIC	<i>Water Sector Reform Implementation Committee</i>
WSS	<i>Water Supply and Sanitation</i>
WWAP	<i>World Water Assessment Program</i>

point. Uganda's lowest point is Lake Albert (640 m a.s.l.) The northern part of the country has a sprinkling of mountains, the highest of which is Mount Kaddam (3100 m a.s.l.). With the exception of the Rwenzoris, the mountains of Uganda are all of volcanic origin. A few of them are dormant volcanoes while the rest are extinct volcanoes. The Rwenzoris are a host block elevated between faults.

1.3 Geology and Soils

Uganda is made up of predominantly old rocks from the Pre-Cambrian era (3000 – 6000 million years ago). There are also younger rocks, mainly of sedimentary and volcanic origin, from the cretaceous era (135 million years ago). The larger part of the country – more than two thirds – has poor ferralitic soils. These soils have nearly lost all their mineral content through prolonged weathering. They need proper management to give reasonable crop yields. The rest of the country has mostly richer ferruginous and highly productive volcanic soils.

1.4 Land

Uganda has a land area of 199,768 km² a large part (82.7%) of which is arable. Only 42.4% of the cultivable land was under cultivation in 1996, Large commercial farms accounted for only 0.8% of cultivated land in the same year, the rest being under small-scale holdings used for subsistence farming. Agriculture is heavily dependent on rainfall with the area of irrigated land estimated at only 90 km² in 1998.

Table 1.1: Land cover in Uganda

Cover type	Percent
Forests	3.8%
Woodlands	16.7%
Bushes and grasslands	27.0%
Swamps	2.0%
Farmland	35.0%
Built-up areas	0.2%
Open water	15.3%

Source: MWLE

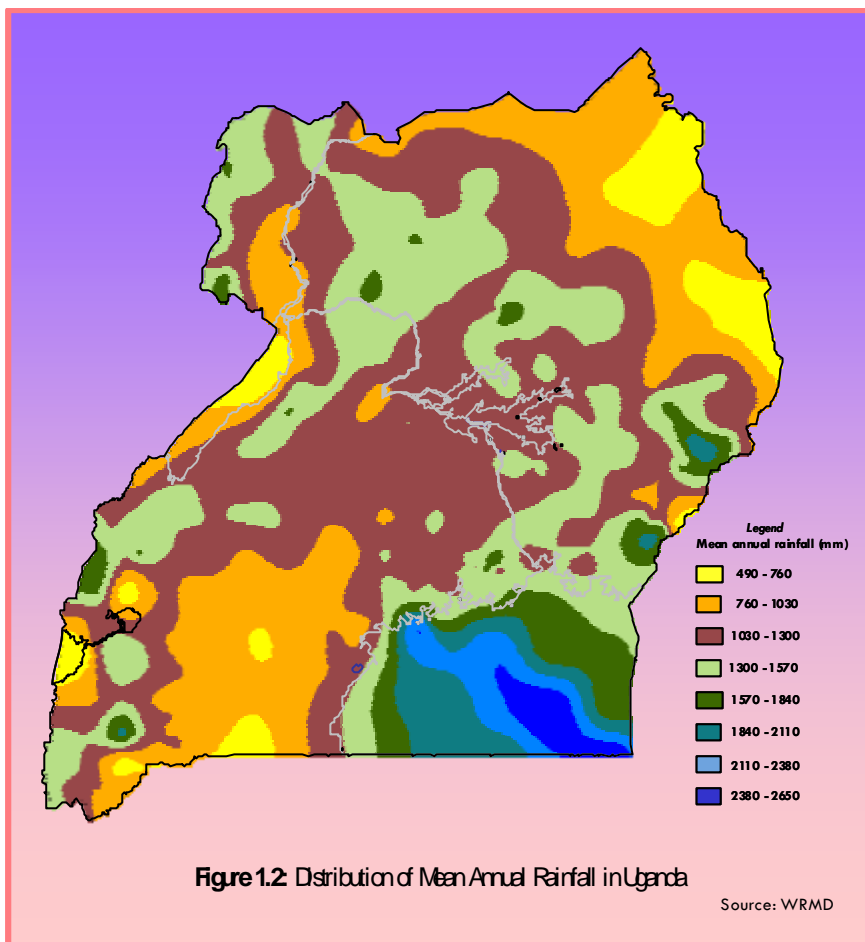
1.5 Rivers and Lakes

With about 43,942 km² of wetlands and open water (16% of total area), Uganda is considered fairly well endowed with water resources. Major water bodies include lakes Victoria (the world's second largest freshwater lake), Kyoga, Albert, George and Edward while major rivers include the Nile (the world's longest river), Ruizi, Katonga, Kafu, Mpologoma and Aswa. The rivers and lakes of Uganda are, with the exception of those in the tiny Northeastern catchment of Kidepo, upper Nile basin. Uganda occupies a dual position in the Nile riparian context, being a lower riparian with respect to Rwanda, Burundi, Tanzania, Kenya and the Democratic Republic

of Congo, and an upper riparian with respect to Sudan.

1.6 Climate

Uganda has a tropical climate characterised by strong seasonality in rainfall as a consequence of the influence of the seasonal latitudinal movement of the equatorial low-pressure trough and inter-tropical convergence zone (ITCZ). Mean annual rainfall for the country is 1300 mm but shows great spatial variability, averaging from as low as 100 mm in the semi-arid parts of Karamoja in Northeastern Uganda to over 3000 mm on the slopes of Mountain Elgon.



The country experiences two annual rainfall maximas between March to May and September to November. In the drier parts of the country, rainfall between the two maximas is not strikingly different thereby producing a unimodal type of distribution. These parts of the country are characterised by one long dry season followed by one long wet season. In the rest of the country, rainfall has a bi-modal (twin-peaked) pattern with a pronounced dry season between the two rainfall maximas.

The country is pleasantly cool with a long-term mean temperature of 21° C. Over a year, mean temperatures range from a minimum of 15° C in July to a maximum of 30° C in February. In the highlands and around mountains, the elevated landmass exerts a local influence in climate producing rainfall and temperatures that are unique from the lowlands.

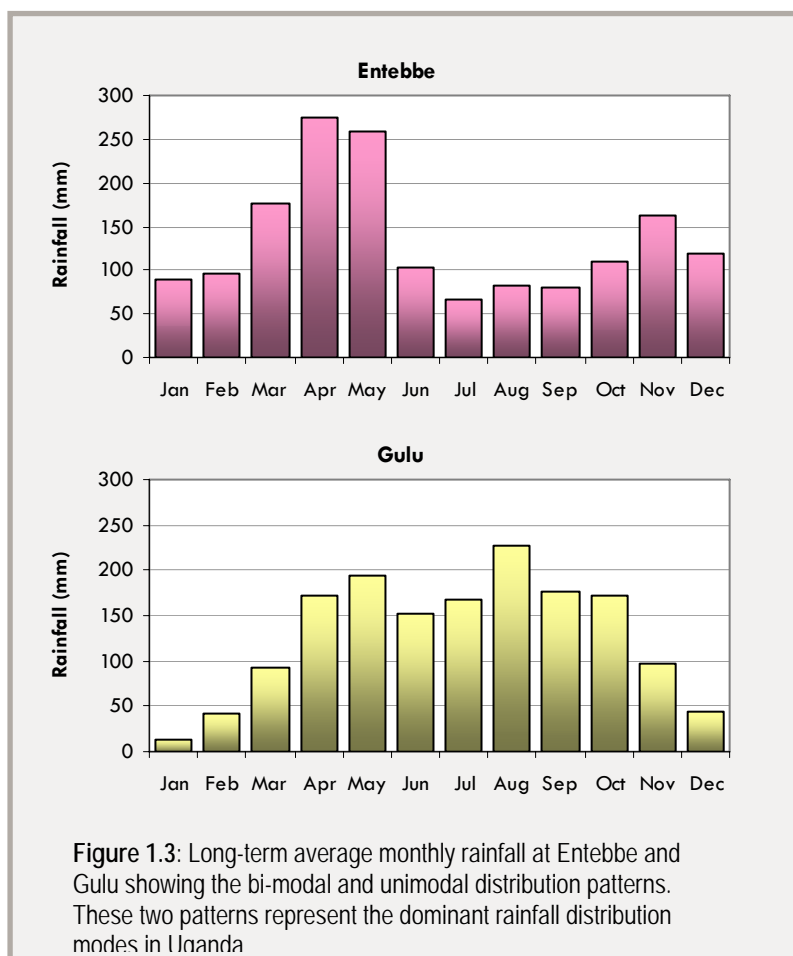
1.7 Climate Change

Climate change, which is a term used to describe a gradual shift in one or more climatic elements from a long-term norm, manifests in Uganda in the form of global warming and climate variability.

The continent of Africa warmed up by 0.5°C in the past century. The five warmest years in Africa's recorded history all occurred after 1988. These changes are attributed to global warming. One impact of temperature rise has been the melting of ice and glaciers on mountaintops. The Rwenzoris are one of a few of permanently ice-capped mountains in Africa. Recent studies have shown that the glaciers and ice fields on this mountain have decreased markedly both in number

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and size and that the rate of shrinkage has been greatest after 1990. The Rwenzori Mountains presently have 37 small glaciers and ice fields covering an area of 64 km².



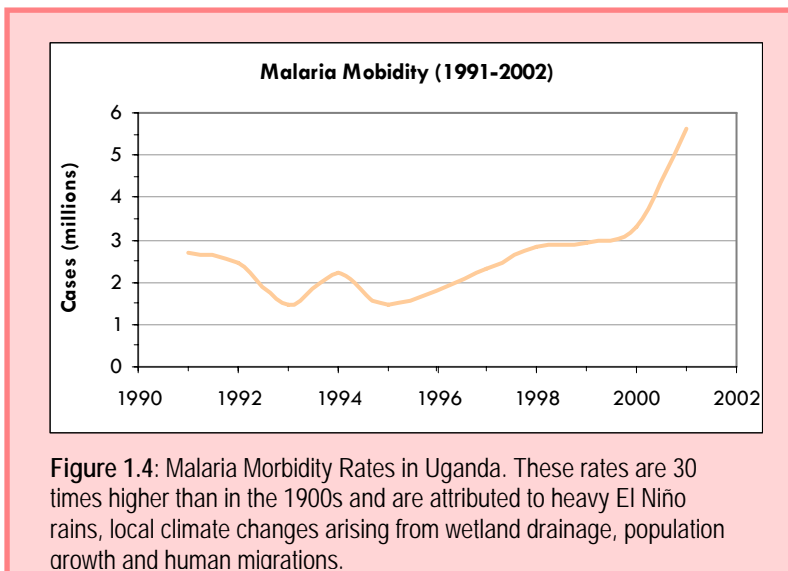
Temperature rise is also thought to be behind the increase in morbidity and mortality of malaria in Africa. In Uganda today, malaria incidences in the highlands (1500-1800 m a.s.l.) are 30 times higher than at the beginning of the 20th Century. Malaria has for long been the leading cause of illness in Uganda and accounted for 38.7% of all morbidity cases in 2002. As a further illustration of Uganda's vulnerability to temperature rise, a modelling study by GRID-Geneva in 1989 showed that a 2°C rise in temperature would lead to an 85% shrinkage in the area suitable for growing rubusta coffee, a situation which spells economic doom for Uganda.

Climate in Uganda, particularly rainfall, has been erratic since early 1990s. The incidence, duration and amount of rainfall

have all exhibited abnormal departures from long-term means. While rainfall in some years was far short of long-term means thereby causing droughts, in other years it was excessive and produced catastrophic floods.

The heaviest rains in recent years were recorded in 1994 and were associated with the El Niño phenomenon. The rains led to sharp rises in lake levels, widespread flooding, washing away of roads and bridges, extensive soil erosion and landslides. In Lake Kyoga, rising water levels caused detachment of previously firmly anchored floating papyrus swamps. The freed swamps drifted downstream and collected at the outlet of the Nile from the lake, causing a near total blockage there. The blockage cause a further rise in lake levels and led to partial inundation of marginal homesteads and farmlands, the spread of water-borne diseases and disruption of economic activities around the lakeshores. As water levels above the blockage continued to rise, levels (in the Nile) below the blockage dropped significantly. The blockage was cleared in 2001 through dredging with equipment provided by Egypt, a Nile riparian. The government in 2000 set up a programme "The Mitigation of Lake Kyoga Floods" aimed at alleviating the economic hardships brought upon the local communities in Kyoga basin by the floods and lake level rise.

Additional to the variability in rainfall amounts has been the confusing shifts in season since the early 1990s, with heavy rains falling in the months expected to be dry and persistent desiccating sunshine experienced in the months that are normally wet and cold. Since Uganda's agriculture is heavily dependent on rainfall, the erratic swings in season have caused an increase in frequency of food and water shortages in the country, with the worst hit area being the dry cattle corridor that stretches from the Uganda-Tanzania border to Karamoja region. Death of livestock from lack of water in the corridor has been common and has forced traditional pastoralists to migrate with their herds during hard times to neighbouring districts or game reserves. In Karamoja and Teso regions, several deaths from starvation have been recorded in recent years.



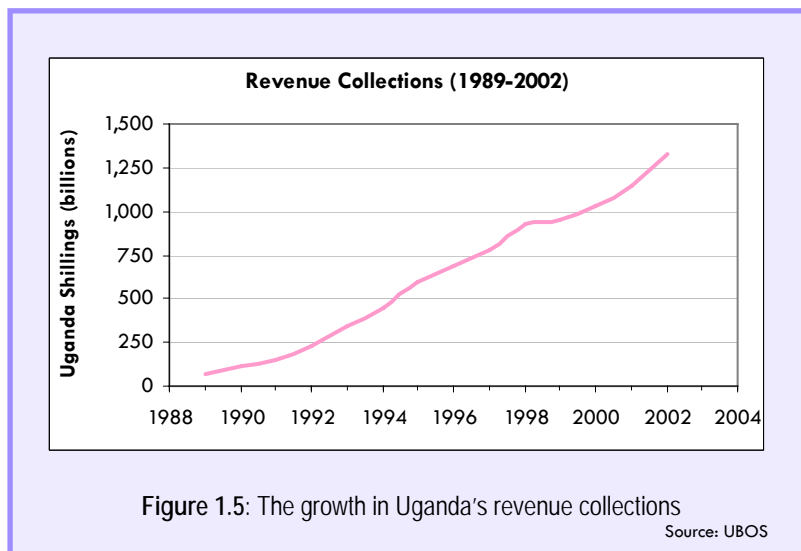
1.8 Economy

Once a strong thriving economy, Uganda shortly after attaining independence went through a period of neglect, mismanagement and political upheavals that sent the country's economy to the doldrums. The demise of the economy was catalysed not by internal factors alone but by also by certain external factors, notably the 1970s rise in price of petroleum products, the 1977 break-up of the East African Community and the 1980s slump in world coffee prices.

Since 1986, Uganda has been on a recovery path following the introduction of judicious macro-economic policy reforms that brought about fiscal discipline and led to restructuring of public expenditure and liberalisation of the economy. The reforms stabilised the economy and led to increased investments and faster economic growth. The country has maintained an average annual GDP growth rate of 6.9% since 1986 earning it praise from the IMF. Inflation has been brought down from an all time high of 200% in 1987 to an average of 5.25 since 1992. Tax revenue collection as a percentage of GDP has increased steadily from 6% in 1986 to 13.7% in the 2002/03 fiscal year. The government is working to steer the country away from an over-dependence on agriculture by increasing the contributions of industry and services to GDP. At the same time the dependence on coffee, which in the early 1990s accounted for more than 80% of Uganda's foreign earnings, is being gradually lessened by promoting investment in fish processing, horticulture and floriculture.

Uganda, despite the above impressive growth in economy, remains one of the world's poorest countries with close to 40% of her 24.7 million people living below the poverty line. The United Nations Development Programme in its Human Development Index for 2002 ranked Uganda in

the 142nd position out of 162 countries evaluated. The recovery has also been less striking on the international trade scene where the country continues to experience unfavourable balances with annual trade deficits running above 500 million dollars. Poor terms of trade, a narrow export product base and export of unprocessed materials are blamed for the dismal performance.

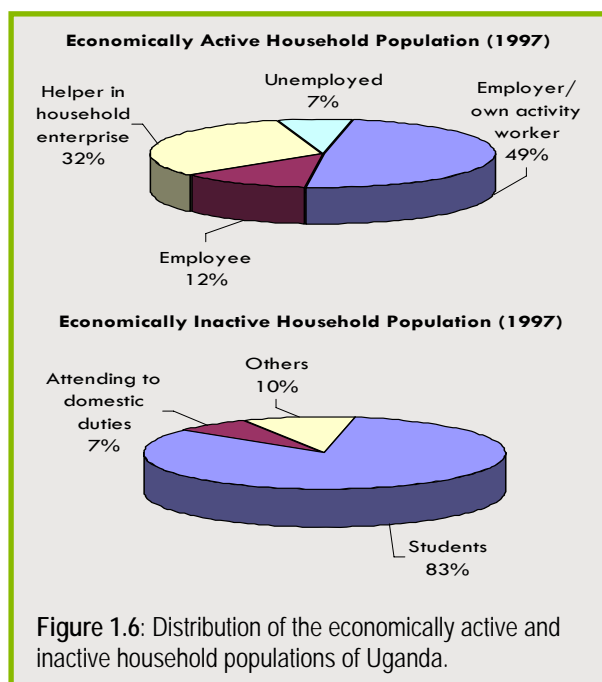


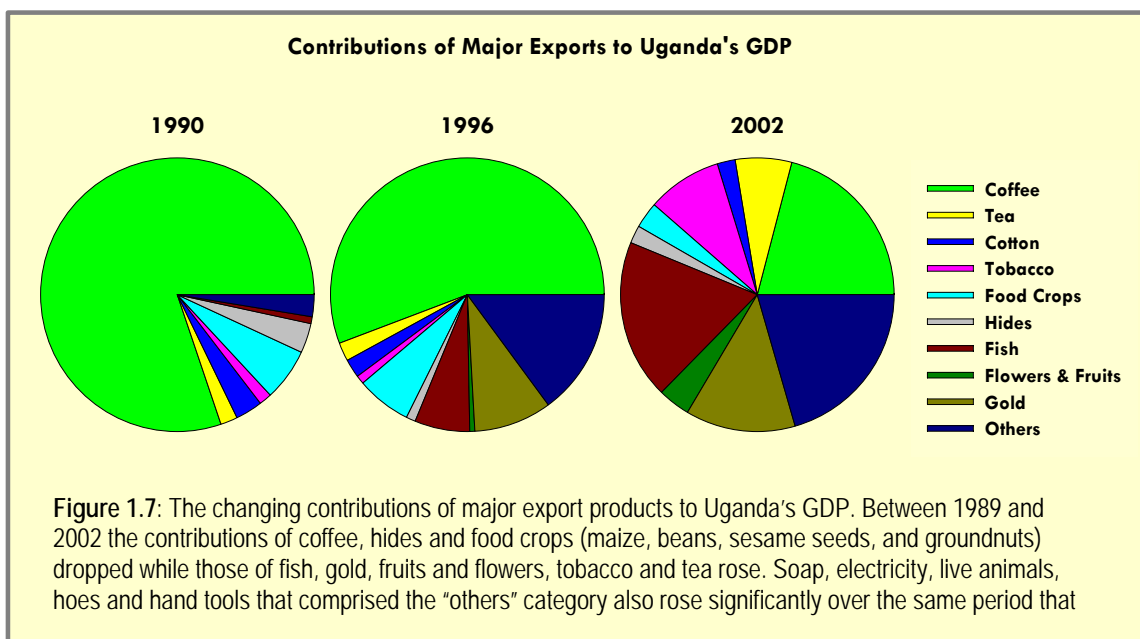
Poverty reduction has since early 1990s been a leading objective of Uganda's development strategy. Government aspires to bring down poverty levels to 10% and 30% of the population living in absolute and relative poverty respectively by the year 2017. To guide its efforts in combating poverty, government prepared a Poverty Eradication Action Plan (PEAP) in 1997. The plan, which has since received two revisions, employs a multi-sectoral approach that takes into consideration the multi-dimensional nature of

poverty and the inter-linkages between influencing factors. In PEAP a four-pronged approach is pursued: poverty is brought down by a multiplicity of actions leading to (a) the forging of a framework for economic growth and transformation, (b) the promotion of good governance and security; (c) the direct improvement of poor people's ability to generate income; and (d) the direct improvement of poor people's quality of life. The government, in keeping with PEAP tenets and strategies, makes continuous interventions in the areas of rural feeder roads, agricultural modernisation, land management, rural credit and microfinance, rural market infrastructure, rural electrification, primary health care, primary education and water supply and sanitation.

One of PEAP's critical interventions is in the modernisation of agriculture. Considering that the agricultural sector employs over 80% of Uganda's labour force and is the main stay of the economy, the intervention has the potential of affecting and bettering the lives of most Ugandans. Government has prepared a Plan for Modernisation of Agriculture (PMA) through which it has initiated programs for boosting agricultural production and the marketing and processing of agricultural produce and products.

Uganda's elaborate plans and investments to combat poverty have already paid dividends. Income poverty levels declined from 50% in 1992 to 35% in 2000. The economic recession that hit many parts of the world after 2000 slowed down the steady progress and returned poverty levels to 38% in 2002.





In recognition of the progress made by Uganda in implementing economic reforms and poverty reduction, and as an incentive for further economic growth, the international community, through the IMF Heavily Indebted Poor Countries (HIPC) Initiative and Enhanced HIPC Initiative, has cancelled a large part of Uganda's external debt. In 1998, Uganda obtained a 650 million dollars debt relief from the Heavily Indebted Poor Countries (HIPC) Initiative while in 2000, it obtained an additional 1.3 billion dollar relief from the Enhanced HIPC Programme. Total debt relief under this arrangement thus amounted to approximately US \$ 2 billion – about three-fifths of Uganda's external debt. These measures have enabled the country to re-channel badly needed financial resources to the fight against poverty.

1.9 Population

Uganda's population in 2002 stood at 24.7 million and was projected to reach 25.4 million in 2003. Between 1991 and 2002, the population grew at an average annual growth rate of 3.4% - one of the highest rates in the world. The high growth rates are a result of high fertility levels (7.1 children per woman) and a decline in infant and child mortality over the years.

Uganda's population is a young one with children under 15 years comprising more than 50% of the total population. The majority of the people are hence young dependants. People above the age of 65 make up only 2% of the total population. The average life expectancy for Uganda in 2002 was 43.8 years, a situation blamed on poverty and HIV/AIDS prevalence. AIDS is the leading cause of death among 15-49 years old and is responsible for 12% of all annual deaths. Social development indicators for Uganda are summarised in Table 2.1.

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1.10 Millennium Development Goals - Status

Table 1.2 – Status of implementation of the Millennium Development Goals

GOAL	PROGRESS TARGET			
	1995	2000	2003	2015
GOAL 1: Eradicate Extreme Poverty and Hunger				
✓ Poverty Head Count (Po)	50.1	33.8	37.7	28.0
GOAL 2: Achieve Universal Primary Education				
✓ Net Enrolment Ratio in Primary Education		84.0	86.0	100.0
✓ Literacy Rate of 15-24 year olds	74.8	78.8	80.0	100.0
GOAL 3: Promote Gender Equality and Empower Women				
✓ Ratio of Girls to Boys in Primary Education		0.99	0.99	1.0
✓ Ratio of Girls to Boys in Secondary Education	0.67	0.79	0.82	1.0
✓ Ratio of Girls to Boys in Tertiary education			0.55	1.0
✓ Ratio of literate Women to Men (15-24 years)	0.8	0.84	0.9	1.0
✓ Proportion of Female Members of Parliament	0.18	0.19	0.25	0.5
✓ Share of Women in Wage Employment			0.39	0.5
GOAL 4: Reduce Child Mortality				
✓ Under 5yrs Mortality(per 100,000 live births)	147	152		56
✓ Infant Mortality Rate	81.5	88.4		31.0
GOAL 5: Improve Maternal Health				
✓ Maternal Mortality (per 100,000 births)	527	505		131
✓ Proportion of births attended by skilled health personnel	37.8	39.0		90.0
GOAL 6: Combat HIV/AIDS, Malaria & Other diseases				
✓ HIV/AIDS Orphans (thousands)				
✓ HIV Prevalence among 15-24 year olds				
GOAL 7: Ensure Environmental Sustainability				
✓ Proportion of Population (Urban) with access to an improved water source		87.0	84.0	100
✓ Proportion of Population (Rural) with access to an improved water source		57.0	59.0	62.0
✓ Proportion of Population with access to improved sanitation		82.0	87.0	100
GOAL 8: Develop a Global Partnership for Development				
✓ Debt Relief Committed under HIPC Initiative (US\$ Million)		69.7	86.6	

(Source: Uganda Bureau of Statistics, 2005 Statistics Abstract)

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