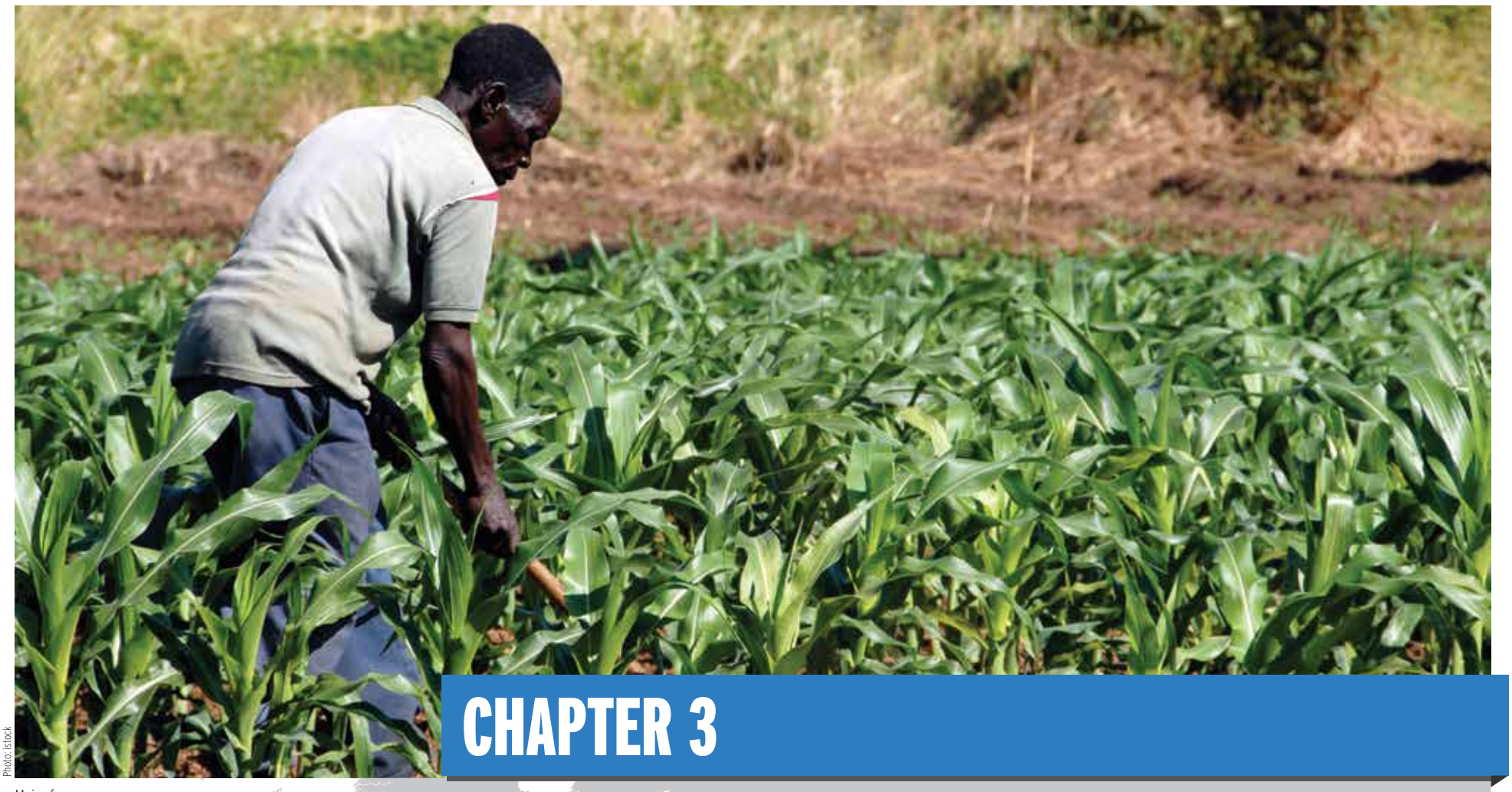


Photo: istock

Maize farm

CHAPTER 3

THE SOCIO-ECONOMIC PROFILES OF THE NILE BASIN COUNTRIES

KEY MESSAGES

Population is increasing; Almost all Nile Basin countries sustain significant deficits in providing basic needs;

Population has been growing in all basin countries

As of 2012, Nile Basin countries' total population is estimated at over 480 million, which means Nile Basin countries are home to over 40 percent of the African population. Some 257 million people live within the Nile Basin boundary.

In all countries, urban population is expected to continue growing accompanied by a relative shrinking of rural population.

The population of Nile Basin countries grew by over four fold in 50 years between 1960 and 2010. As a result, the demand for food, energy and water has been escalating. Per capita water availability has been declining as the population has grown exponentially.

There is considerable unmet demand for basic needs

Almost all countries have made progress in terms of increasing the proportion of population with access to clean drinking water. However, overall, the proportion of the population with access to basic needs (health, education, sanitation, electricity) is still very low by average global standards. With the exception of Egypt, the percentage of population with access to clean water is quite low by world standards. In 8 countries, the percentage of urban population with access to sanitation is less than 50 per cent. For rural areas, the figure is less than 30 percent.

Per capita electricity consumption for all countries except Egypt is less than 200 kWh per year. This is very low compared to average world consumption.

Nile Basin countries are facing formidable challenges to provide the basic needs of their population. Cooperative management and development of the common Nile resources promises to make significant contribution toward meeting these deficits.

The GDP of nearly all Nile Basin countries has been growing steadily

The GDP of nearly all basin countries is increasing, indicating expanding economies. Countries that showed relatively high GDP growth rates are Ethiopia, with average of 7.7 percent per annum for the period 2005 – 2011, and Tanzania, with average of 5.2 per cent for the same period. Five other countries recorded average GDP growth rate of about 3.5 per cent per annum.

There is significant disparity in GDP per capita among Nile Basin countries. Egypt's estimated per capita GDP of over 10,500 USD is more than five-fold the GDP per capita of any of the other Nile Basin countries.

Expanding economies and rapidly growing population bring about opportunities as well as challenges. With growing economies, foreign investment is growing and living standards of the population increasing. However, expanding economies also mean increasing demand for energy, water supply and food. Further, growing urbanization is contributing to increasing demand for energy, food, water and services.

INTRODUCTION

Photo: istock

Girl planting mango tree

This chapter describes the main socio-economic indicators for Nile Basin countries. The objective is to enable better understanding of socio-economic development of riparian countries; and the development challenges they face in meeting the basic needs of their citizens and the opportunities the common Nile Basin water resources offer to address these challenges.

The indicators selected for this chapter provide an overview of the basin in terms of: population its distribution and growth; health related indicators, such as child mortality rates; access to basic services, such as drinking water and electricity; and economic status of the basin countries, such as GDP, poverty level and income distribution. Data used to generate the indicators have been pooled from Nile Basin countries, UN agencies and other global data portals.

DEMOGRAPHY

Population distribution In Nile Basin Countries

Photo: Istock

Group of children, East Africa

The spatial distribution of population in the basin is influenced by a number of factors among which are climate, rainfall, soil fertility, mineral resources, and social and economic infrastructure (transport, education, health, telecommunications, and hospitality sector facilities). The influence of water availability (in the form of large water bodies or rainfall) appears to overshadow other factors.

In the most downstream countries - Egypt and Sudan - human settlement is mainly concentrated along the course of the River Nile. For example, population density is very high in the Nile Delta and Nile Valley in Egypt, yet these areas represent only five per cent of the country's land area.

In the upstream parts of the basin, the pattern of human settlement mainly follows that of rainfall. The highest population densities in the upstream countries are in the Ethiopian Highlands and the Nile Equatorial Lakes Plateau – both regions of high rainfall. Whereas large parts of DR Congo, Eritrea, Kenya, and Tanzania are sparsely populated, there are parts of these countries within the Nile Basin that are densely populated as they fall in the high rainfall belt.

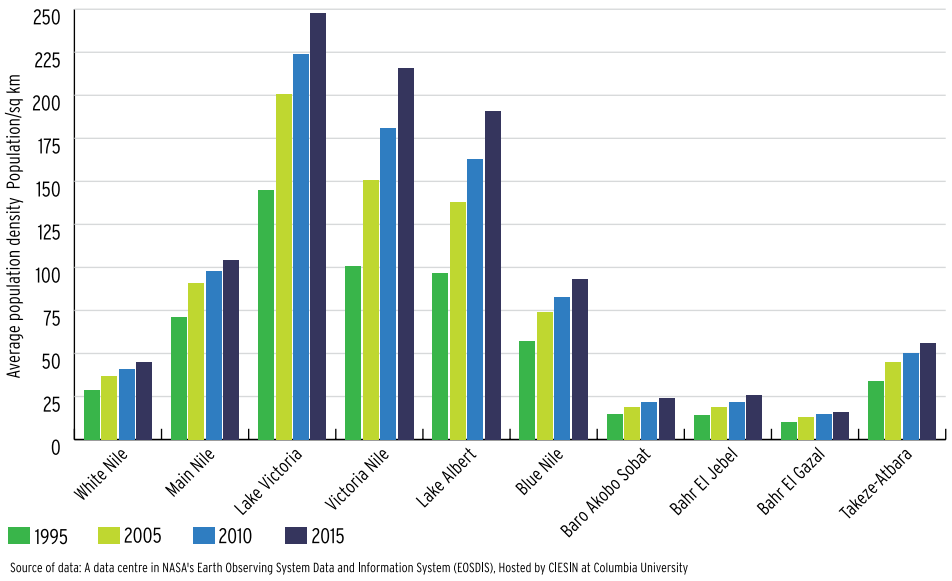
Photo: Nile-SEC

Expanding cities, Cairo, Egypt

Spatial Population Distribution In The Nile Basin

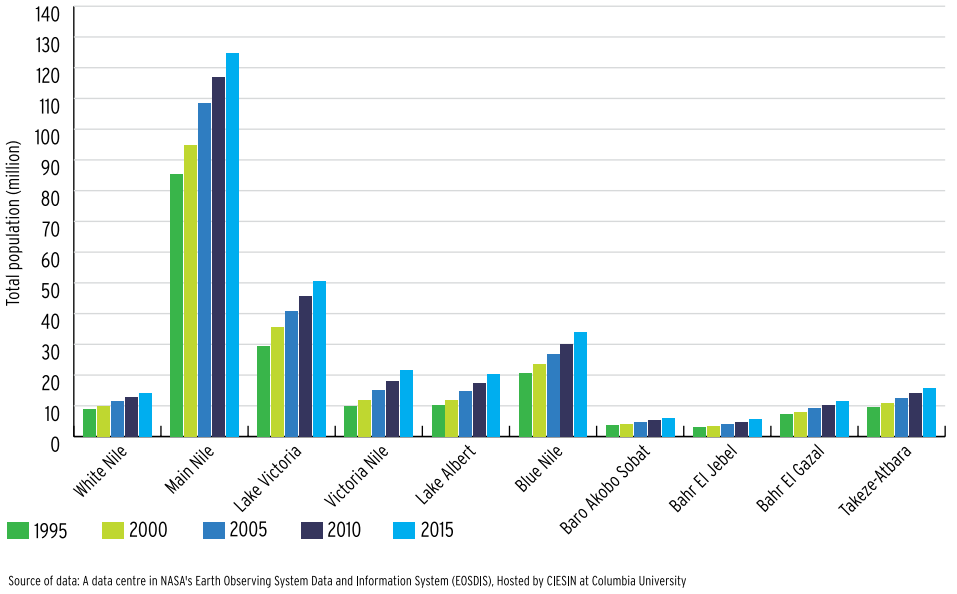
Source of data: A data centre in NASA's Earth Observing System Data and Information System (EOSDIS), Hosted by CIESIN at Columbia University

Average population density trends for the sub-basins in the Nile Basin (1995 – 2015)



Source of data: A data centre in NASA's Earth Observing System Data and Information System (EOSDIS), Hosted by CIESIN at Columbia University

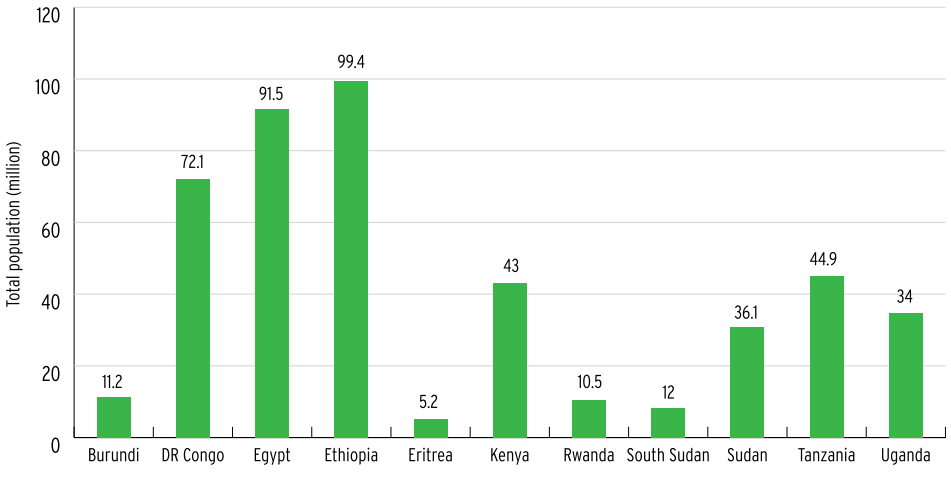
Total population trends for the sub-basins in the Nile Basin from 1995 - 2015



Source of data: A data centre in NASA's Earth Observing System Data and Information System (EOSDIS), Hosted by CIESIN at Columbia University

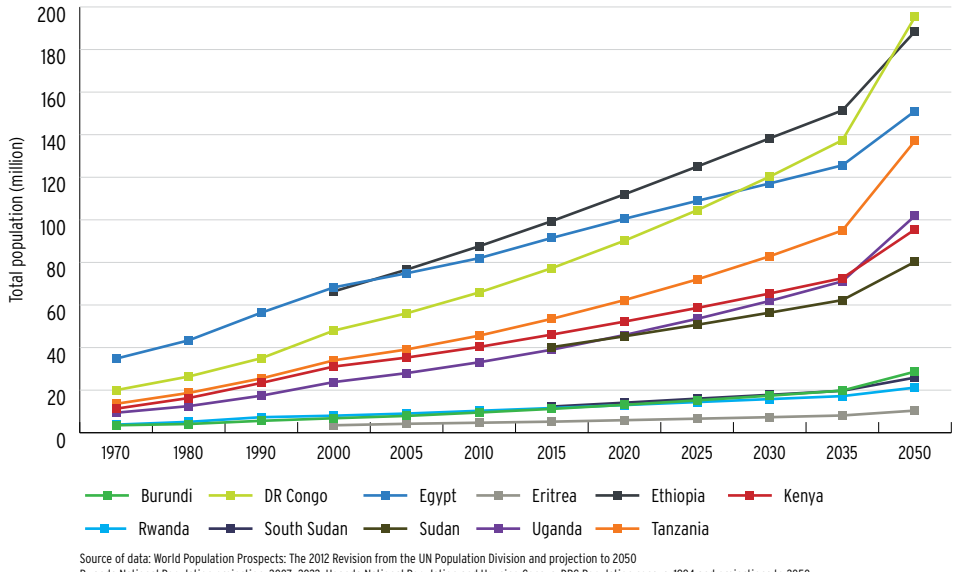
Estimated and projected total population in Nile Basin Countries

Total population in Nile Basin Countries



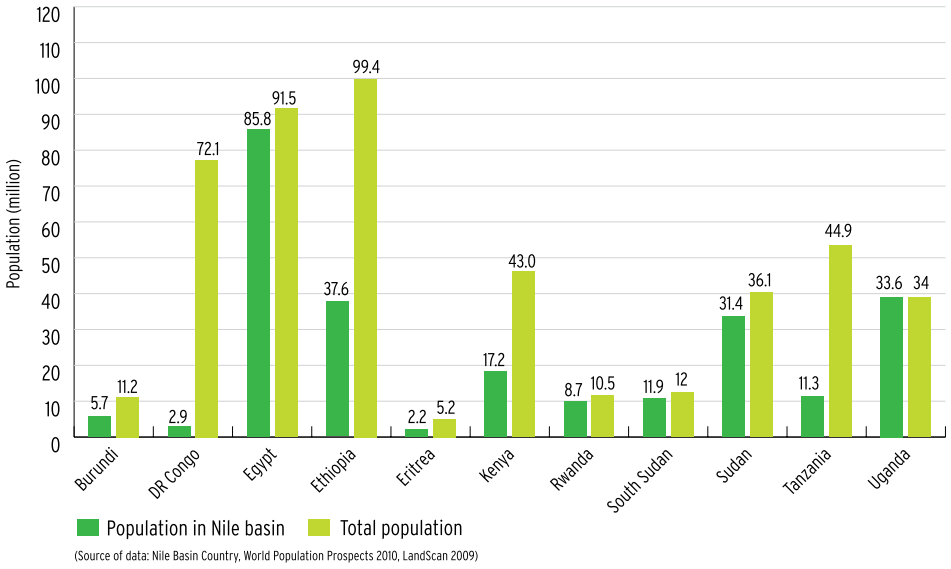
Source of data: National census (Estimated based on census data for DRC, 1984 with estimates for 2013, Kenya, (2014), Tanzania, (2012), Sudan (2014), South Sudan (2014), Uganda (2014), Rwanda, (2012); Burundi, Eritrea, Ethiopia and Egypt - World Population Prospects, UN Population Division, 2012.

Population projection in Nile Basin Countries



Source of data: World Population Prospects: The 2012 Revision from the UN Population Division and projection to 2050
Rwanda National Population projection, 2007 -2022, Uganda National Population and Housing Census, DRC Population census, 1984 and projections to 2050.

Population living in the Nile Basin, 2015

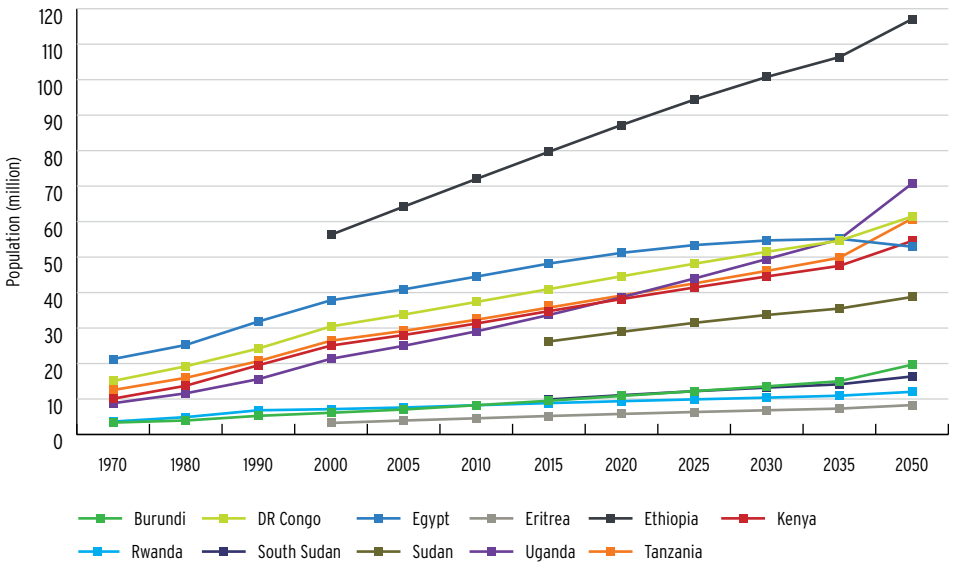


(Source of data: Nile Basin Country, World Population Prospects 2010, LandScan 2009)

The current total population of Nile Basin countries is estimated at 487.3 million. Ethiopia has the highest population (99.4 million) closely followed by Egypt (91.5 million) and DR Congo (72.1 million). Eritrea (5.2 million), Burundi (11.2 million) and Rwanda (11.7 million) have the smallest populations.

The combined population living within the Nile Basin is estimated at 257 million (or 53% of the total population of Nile Basin countries). Egypt has the highest population living within the Nile Basin (85.8 million), followed by Uganda (33.6 million), Ethiopia (37.6 million) and Sudan (31.4 million). Eritrea (2.2 million) and DR Congo (2.9 million) have the smallest populations within the Nile Basin.

Estimated and projected Rural population

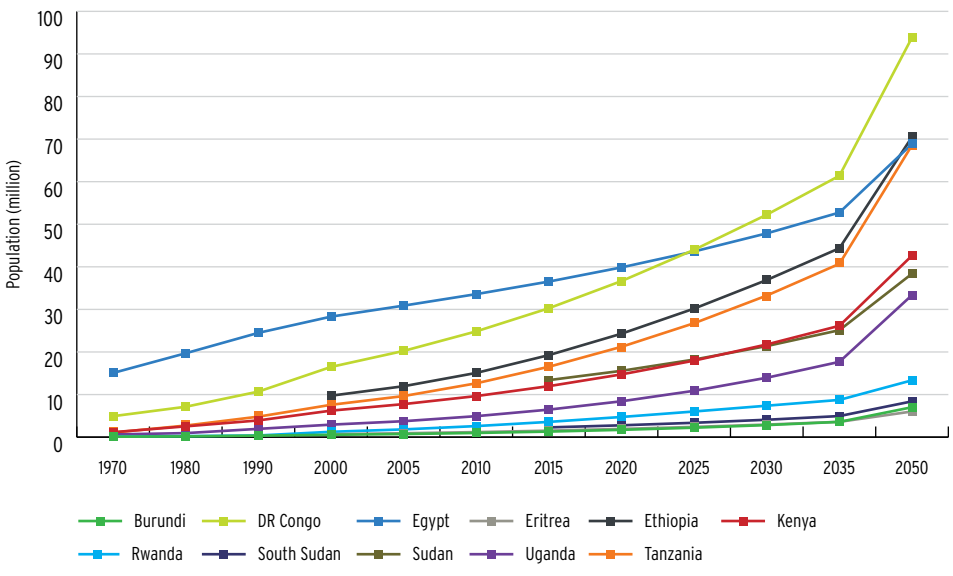


Source of data: World Population Prospects: The 2012 Revision from the UN Population Division and projection to 2050
Rwanda National Population projection, 2007 -2022, Uganda National Population and Housing Census, DRC Population census, 1984 and projections to 2050.

photo: istock

Women from the Masai tribe of Kenya

Estimated and projected Urban population

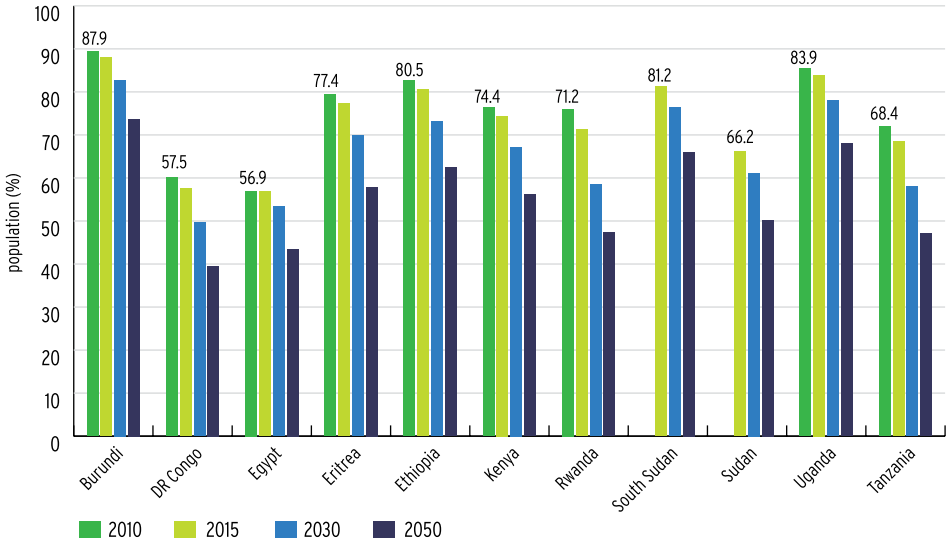


Source of data: World Population Prospects: The 2012 Revision from the UN Population Division and projection to 2050
Rwanda National Population projection, 2007 -2022, Uganda National Population and Housing Census, DRC Population census, 1984 and projections to 2050.

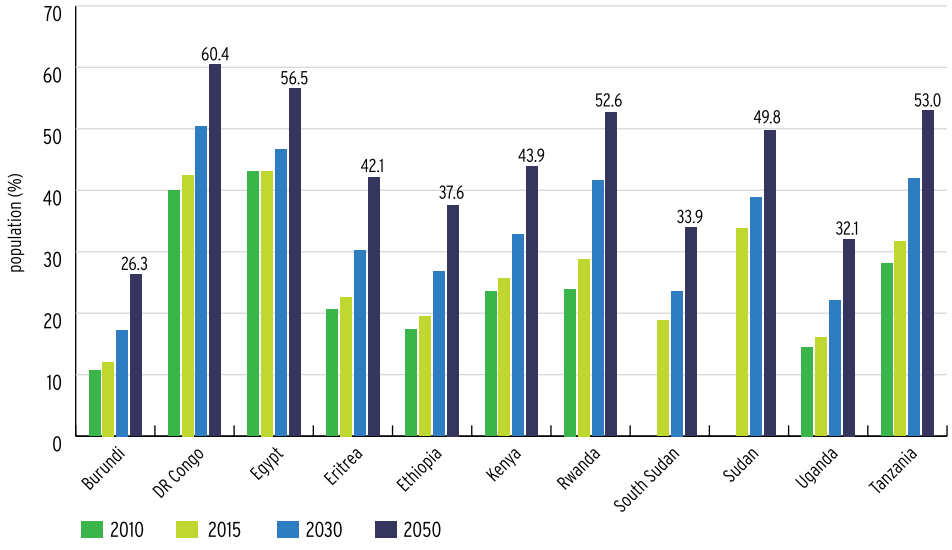
Projections of urban and rural population growth are shown in adjacent charts. The proportion of urban population is expected to rise in all Nile Basin countries. By 2050, the percentage of urban population is expected to reach above 50 percent of the total population in four of the 11 Nile Basin riparian states. In seven countries the urban population makes up more than 40 percent of the total population. In contrast, the rural population is expected to rapidly shrink in all countries.

With increasing urban population, urbanization rate will increase. This, in turn, will result in increased demands for better water supply, sanitation, electricity, communication and other services. Urbanization is expected to increase the pressure on natural resources and the environment as expansion of cities occurs generally at expense of destruction of forests; there is risk of increasing pollution of water resources.

Rural population distribution as a percentage of total population



Urban population distribution as a percentage of total population



The largest share of Nile Basin countries' population is rural. Burundi has the highest proportion of rural population followed by Uganda and South Sudan, while Egypt has the least rural population. Over the next 30 years, however, the proportion of urban population is expected to rise in all Nile Basin countries.

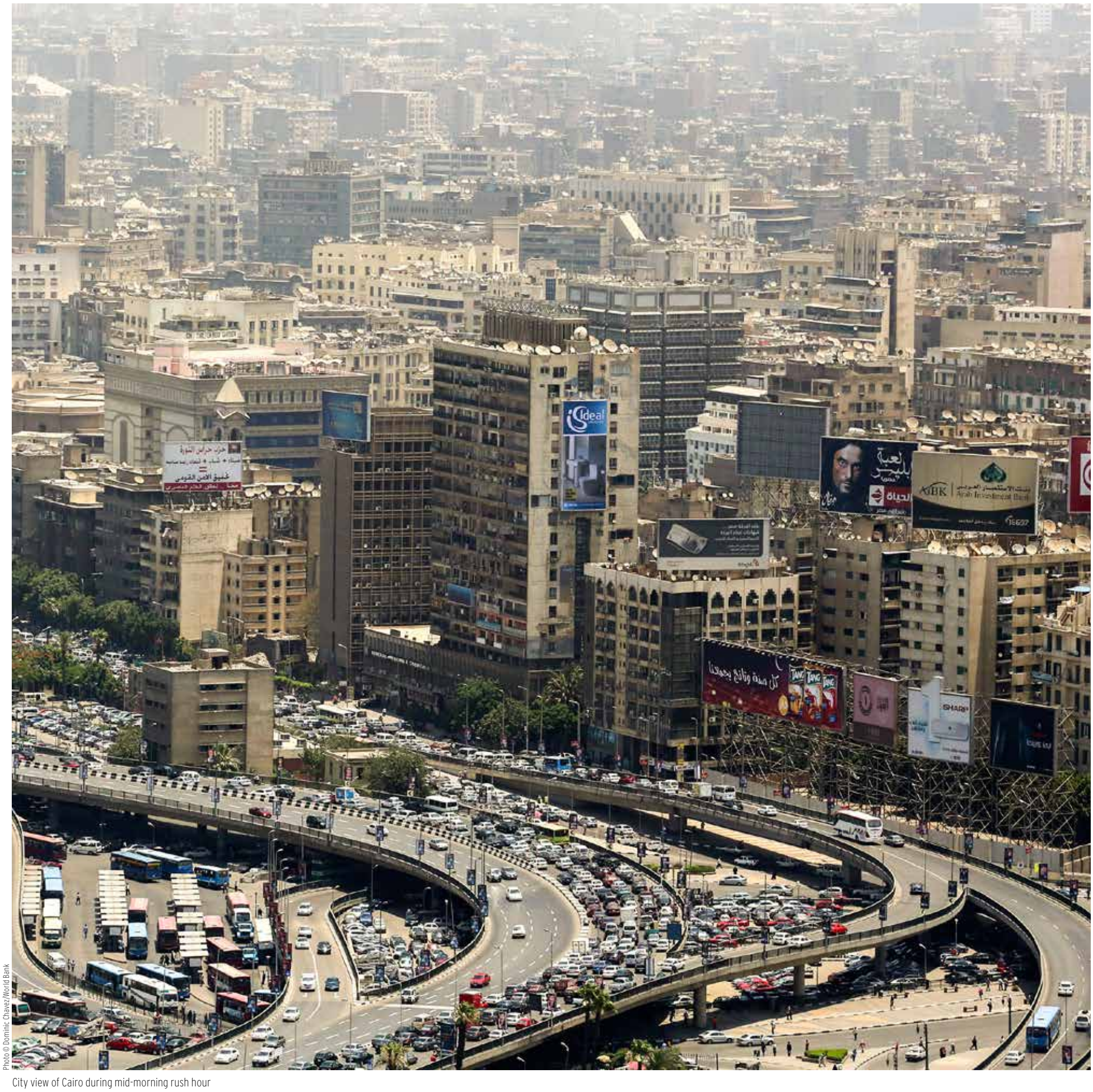
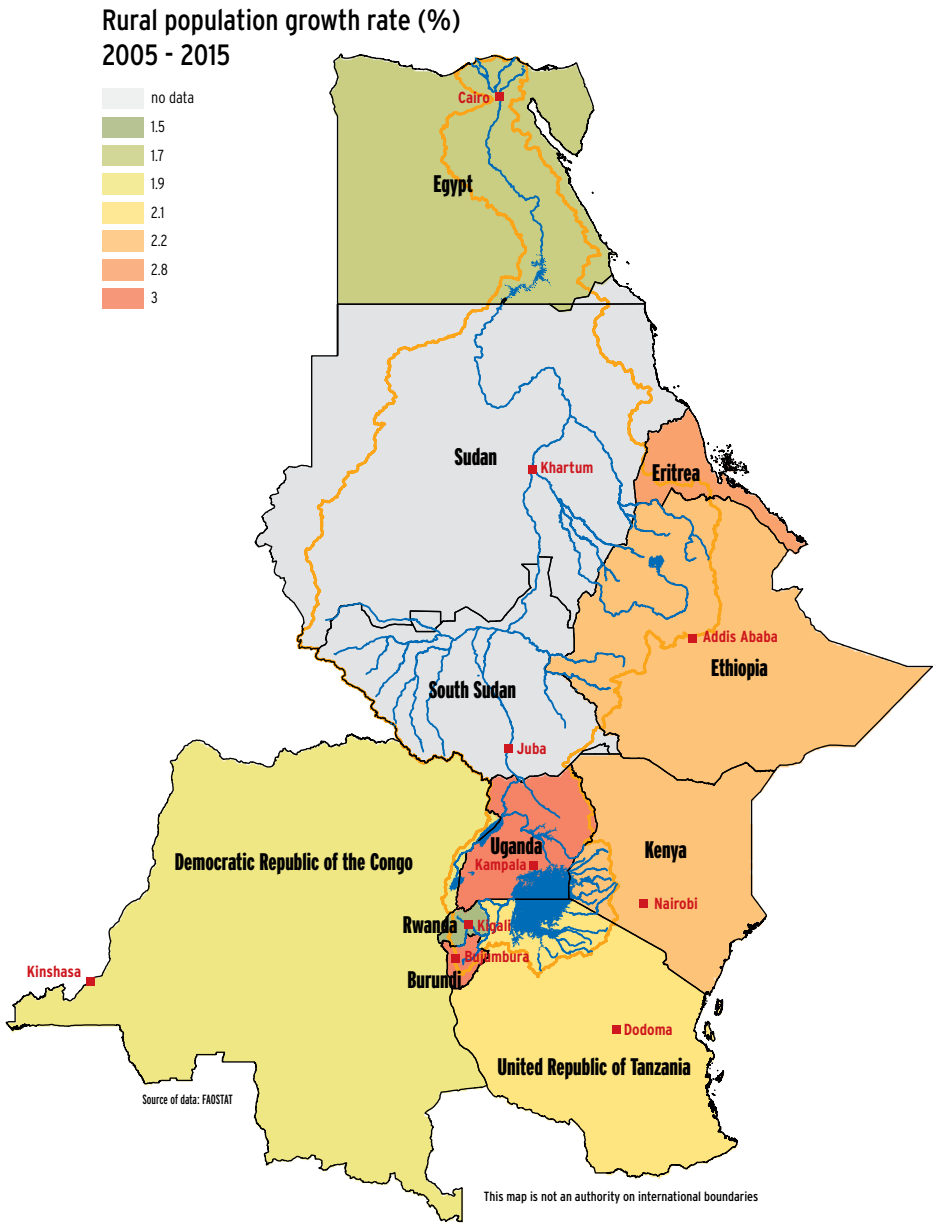
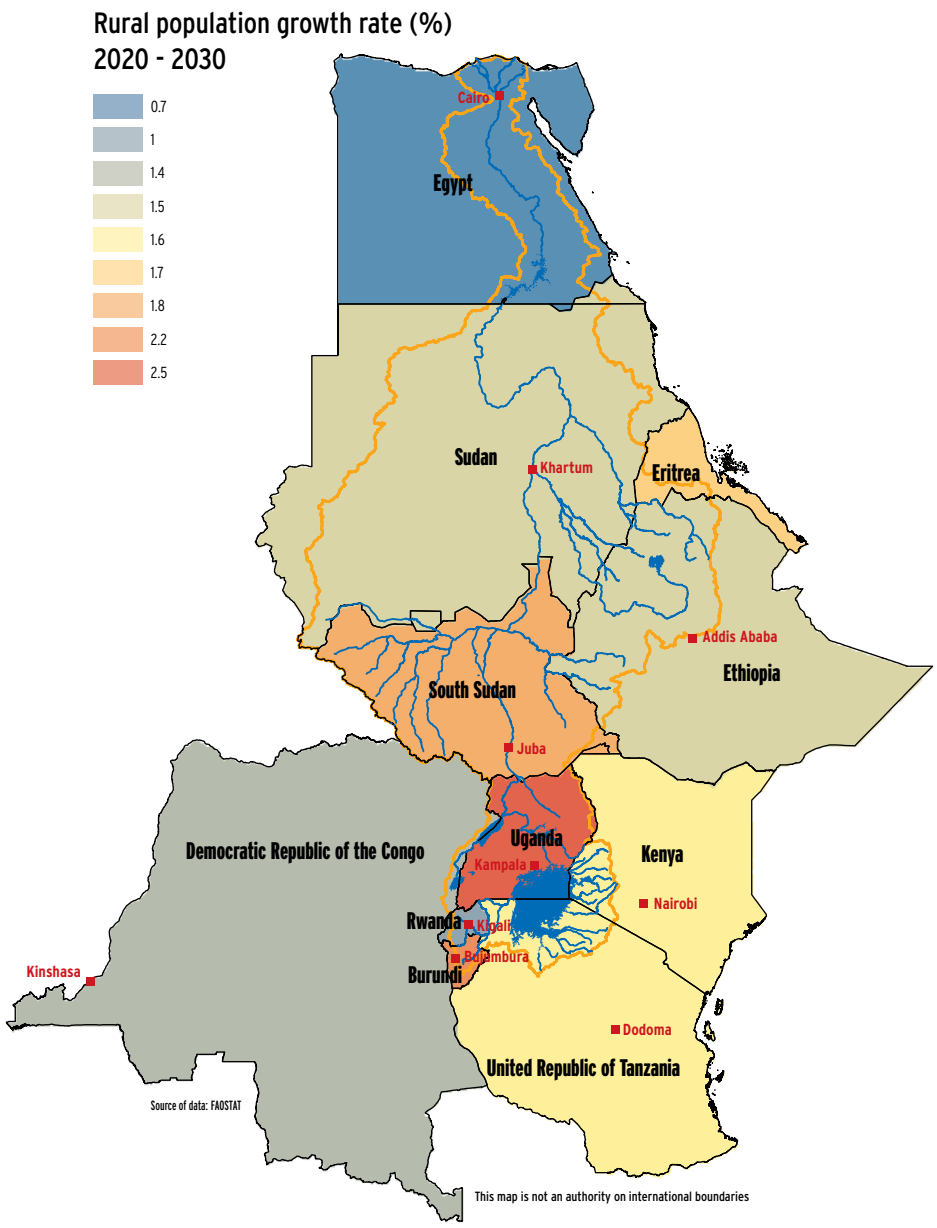


Photo © Dominic Chavez/World Bank

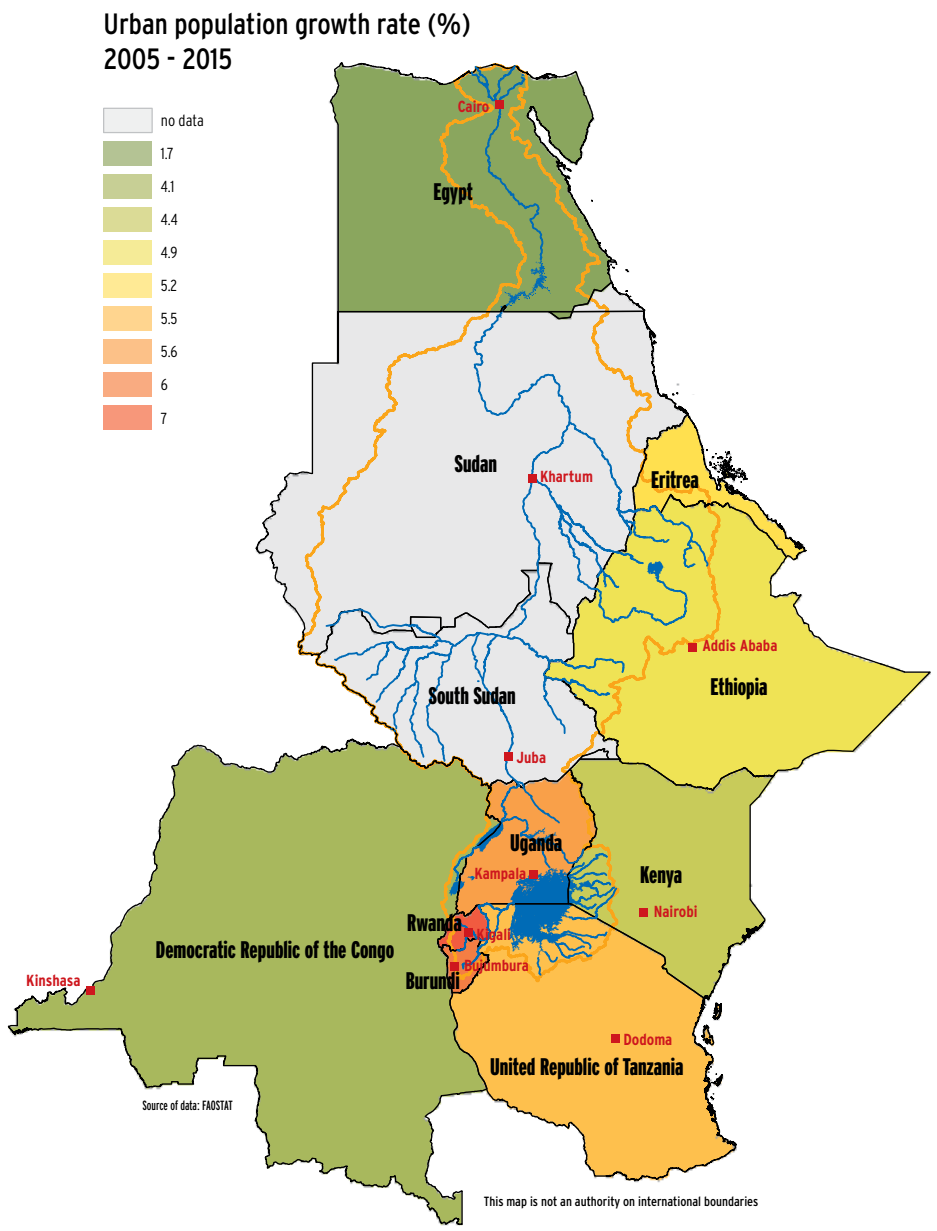
City view of Cairo during mid-morning rush hour

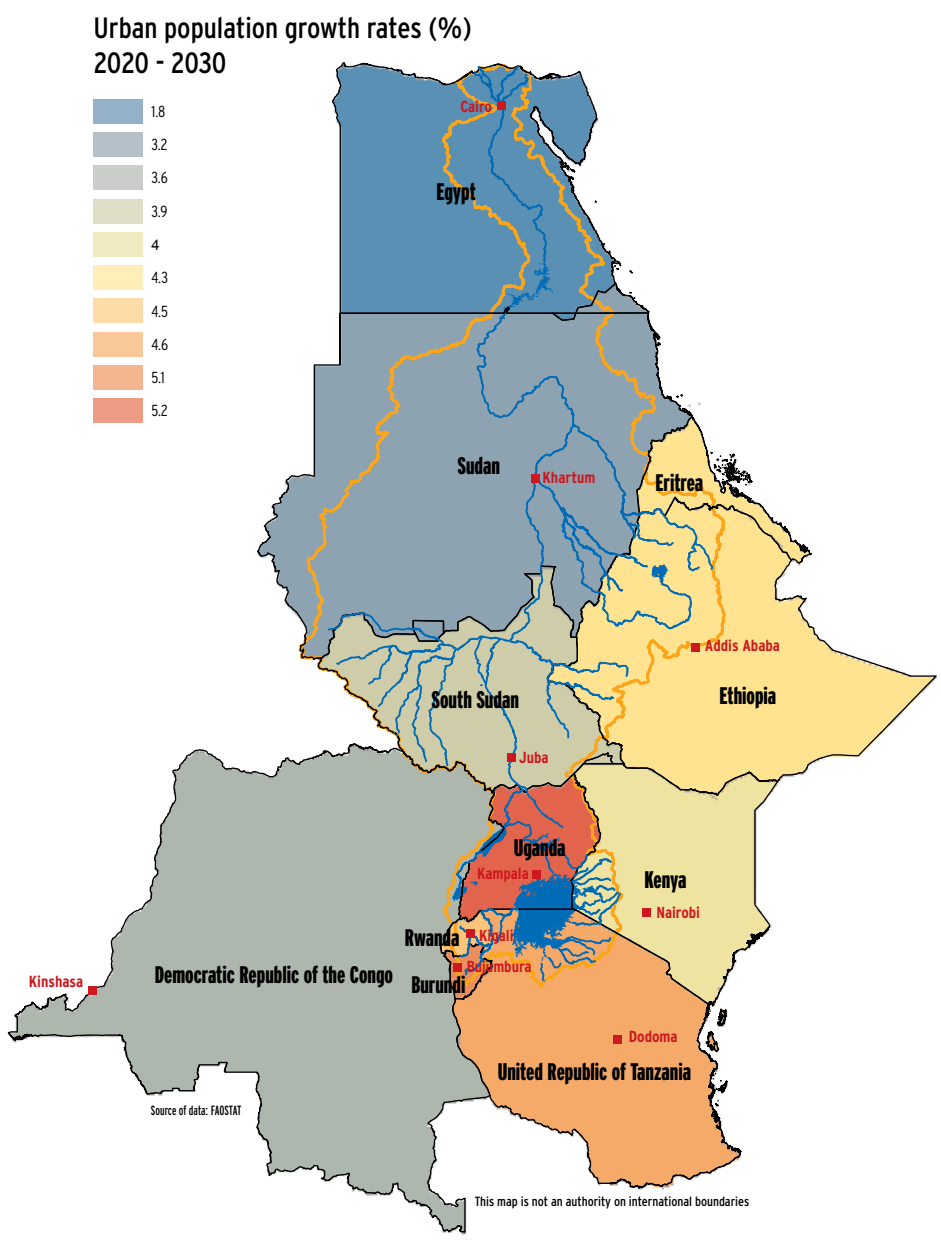
Population growth rates in Nile Basin countries





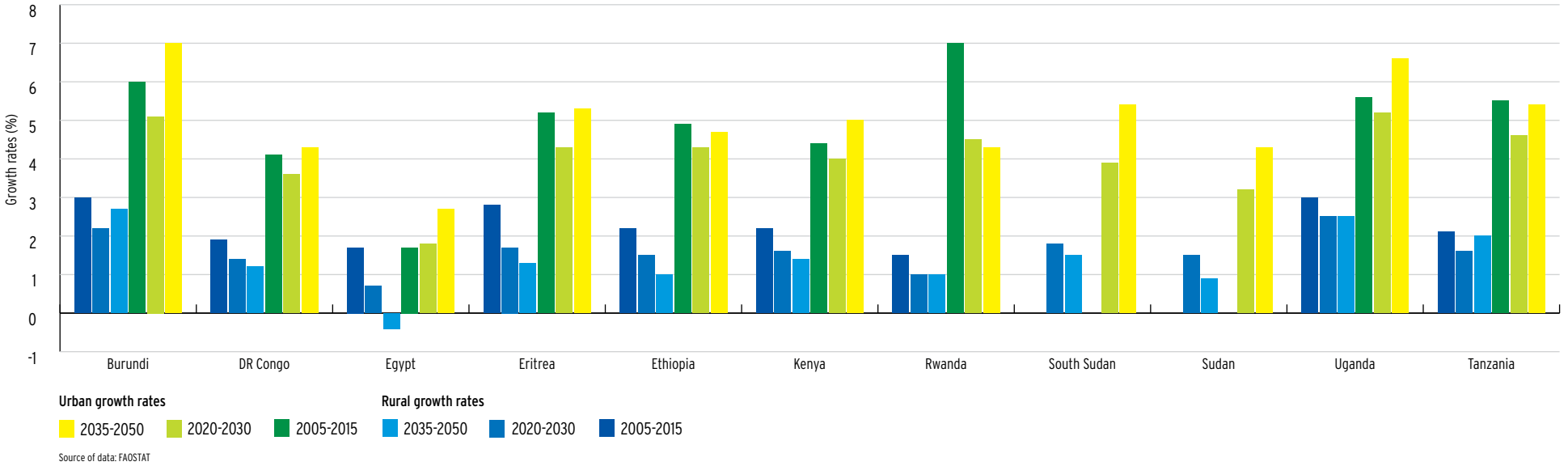
For most countries, the growth rate in rural population is expected to slow down in the period 2020 – 2030 thereby resulting in increasingly smaller proporation of rural population.





The growth rate of the urban population is expected to slow down in all NIle Basin countries

Current and projected rural and urban population growth rates



Source of data: FAOSTAT

	Rural population growth rates (%)			Urban population growth rates (%)		
Country	2005-2015	2020-2030	2035-2050	2005-2015	2020-2030	2035-2050
Burundi	3.0	2.2	2.7	6.0	5.1	7.0
DR Congo	1.9	1.4	1.2	4.1	3.6	4.3
Egypt	1.7	0.7	-0.4	1.7	1.8	2.7
Eritrea	2.8	1.7	1.3	5.2	4.3	5.3
Ethiopia	2.2	1.5	1.0	4.9	4.3	4.7
Kenya	2.2	1.6	1.4	4.4	4.0	5.0
Rwanda	1.5	1.0	1.0	7.0	4.5	4.3
South Sudan		1.8	1.5		3.9	5.4
Sudan		1.5	0.9		3.2	4.3
Uganda	3.0	2.5	2.5	5.6	5.2	6.6
Tanzania	2.1	1.6	2.0	5.5	4.6	5.4

Highest rural population growth rates in the Nile Basin are observed for the period 2005-2015 at the range of 1.5% to 3.0%. In the future (2020-2030 & 2035-2050) the rural population growth rate is projected to decline and the rate is expected to be negative for Egypt by 2035-2050. In contrast, urban population growth rate is expected to increase significantly in all Nile Basin countries.

- Population data refers to the World Population Prospects: The 2012 Revision from the UN Population Division.
- Urban/rural population data refers to the World Urbanization Prospects: The 2011 Revision from the UN Population Division. Long term series estimates and projections from 1961 to 2050.

The average annual population growth rates between 2010/2015 were 3.2% in Burundi, 2.7% in DRC, 1.6% in Egypt, 2.6% in Ethiopia, 2.7% in Kenya, 2.7% in Rwanda, 2.1% in Sudan and 3.0% in the United Republic of Tanzania. Uganda has the highest population growth rate 3.3% in the basin (HDR Statistics 2015). Population projections indicate continued growth in the basin, which will increase the demand for natural resources in the basin countries. The flipside is that this large population also presents an opportunity in terms of a workforce for economic development and a vibrant market for the diverse goods and services

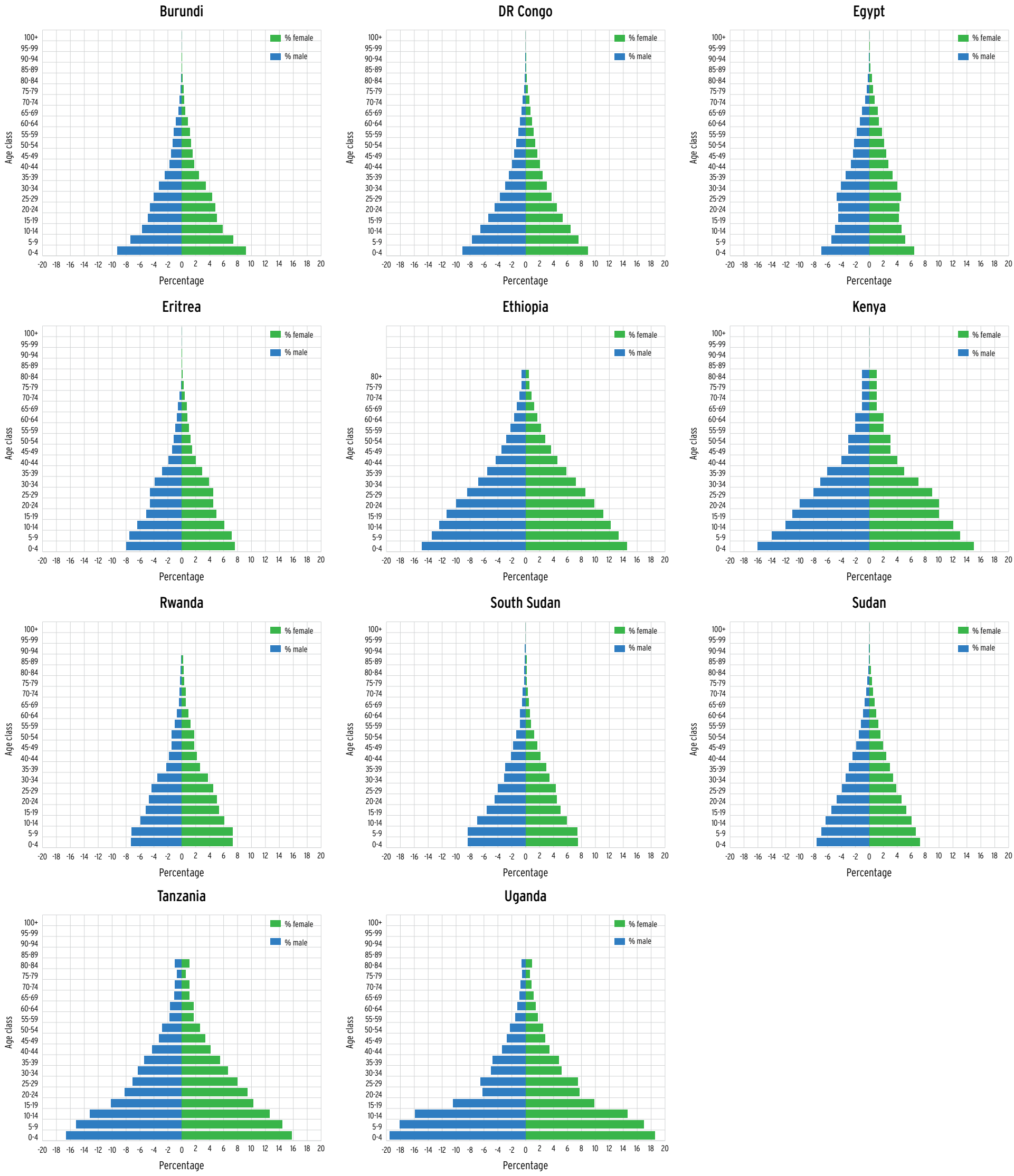
Photo: Salahaldeen Nadir / World Bank

PTA meeting with the new school being built at the background Um Deresayah, North Kordofan, Sudan

GENDER, AGE AND MORTALITY

Gender and age distribution in Nile Basin countries

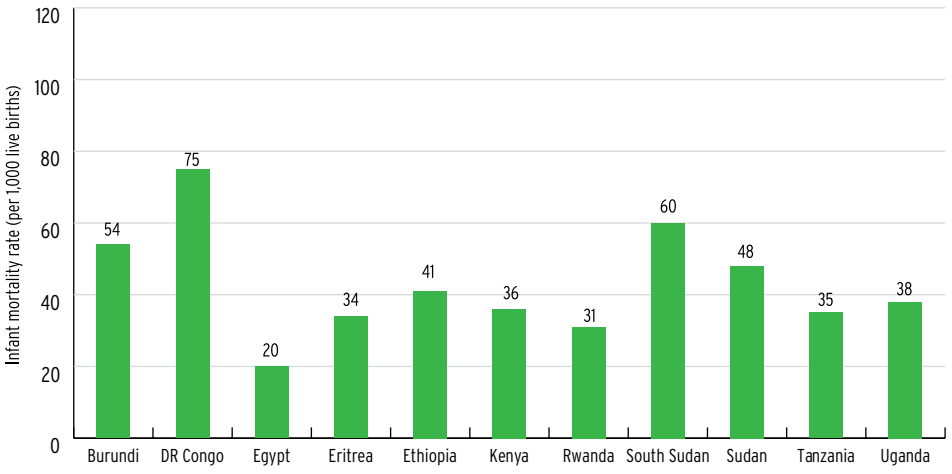
Nile Basin countries feature population pyramids flatter at the bottom, which is characteristic of populations with younger age structure. The broad base and narrow top of the pyramids also indicate low life expectancy. Most basin countries exhibit similar population pyramid structures, with the exception of Egypt, Kenya and Uganda. The population pyramid for Egypt shows a relatively large proportion of the 15 – 34 age group. Kenya, in contrast has the highest proportion of older population (greater than 60 years). Uganda shows a 'denting' in the pyramid, which signifies a relatively small proportion of the 20 – 34 age group. Common to all countries, however, is a high proportion of young population, that age group that is 20 years or under. This could be explained by a change in the dynamics of the demography of the basin, particularly a significant drop in infant mortality rates in all countries (see page 13) accompanied by high fertility rates, though the latter has started to decline.



Data Source: UN population Division 2010 Revision

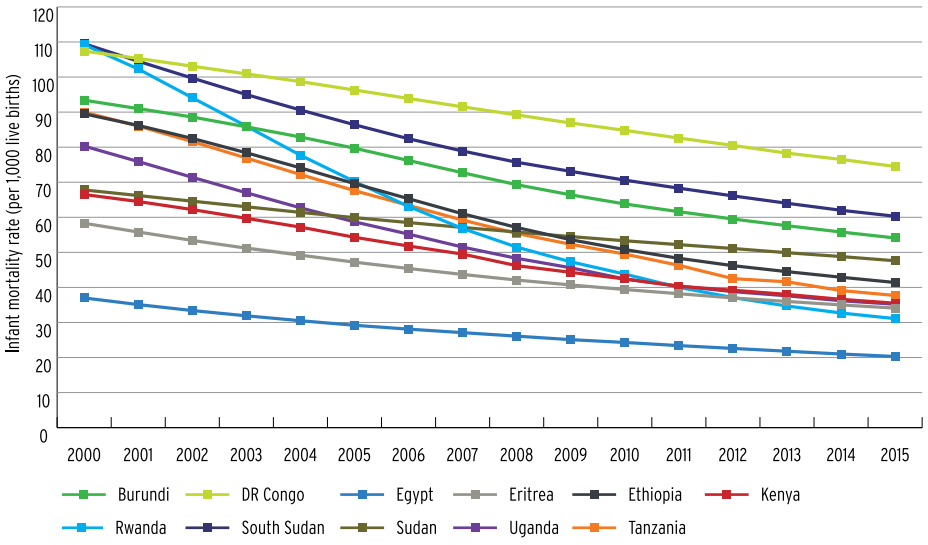
Infant mortality and life expectancy

Infant mortality rate in Nile Basin countries, 2015



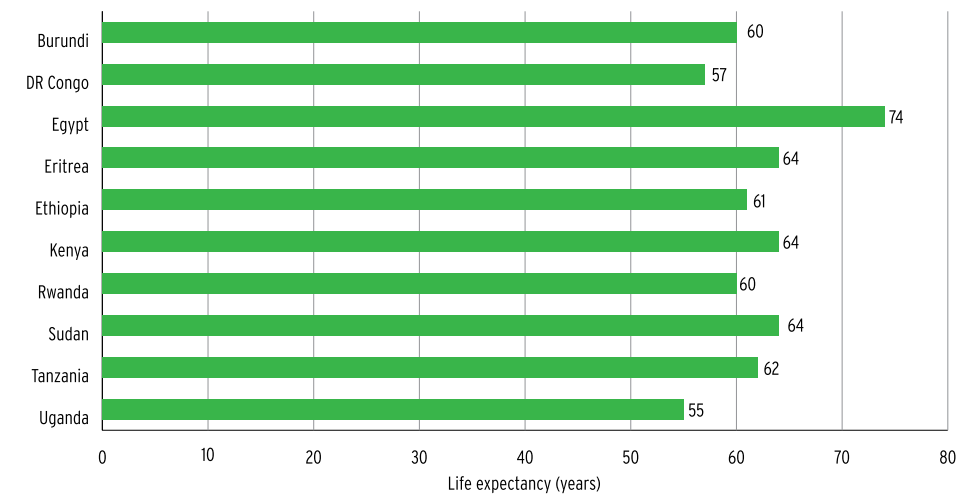
Source of data World Bank, 2015

Infant mortality rates trends in Nile Basin countries



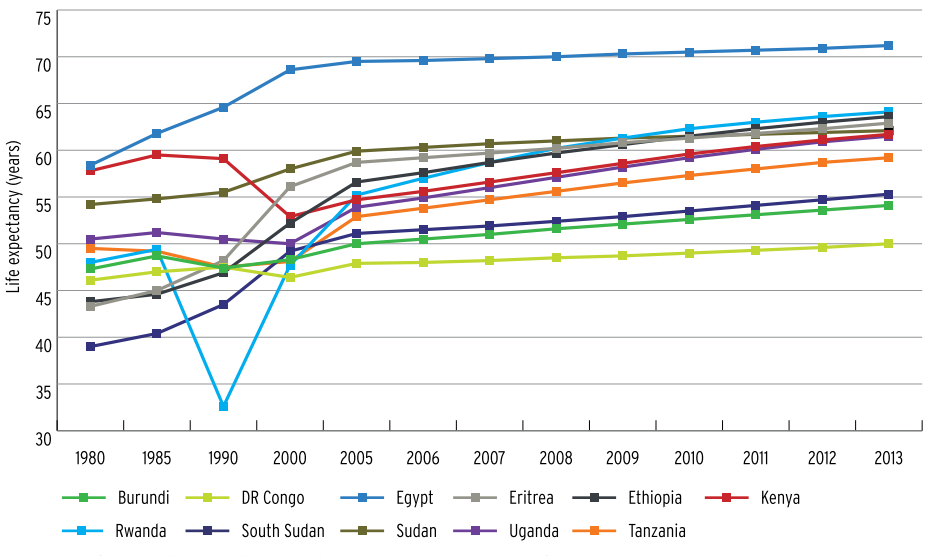
(Source of data: UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division, 2015); National Institute of Statistics of Rwanda (NISR), Rwanda Poverty Profile Report,2013/14, August 2015

Life expectancy at birth for the Nile Basin countries (2015 estimate)



Source: UNDESA (2013a).2012 Revision. World Population Prospects. Population Division Database

Trends of life expectancy for the countries in Nile Basin



Source of data: CIA World Fact Book), 5th Sudan Population and Housing Census, 2008, NBS projections for 2009-2015; Tanzania National Bureau of Statistics, Tanzania in Figure - 2015

The infant mortality rate (IMR) is the number of deaths of infants under one year per 1,000 live births. This rate is often used as an indicator of the level of health in a country. The global average infant mortality rate is 49.4 according to the United Nations. Infant mortality is a very important indicator of human development - any improvement in the living conditions and poverty status of the population is immediately reflected in a decline in the level of infant mortality.

For the Nile Basin countries, DR Congo has the highest infant mortality rate (75), followed by South Sudan (60) and Burundi (54). Egypt has the lowest infant mortality rate (20), followed by Rwanda (31).

In all basin countries, infant mortality rates have decreased over the past 15 years, which indicates, among others, increase in access to health services. Decreasing infant mortality rates coupled with high fertility rate in all basin countries, however, has led to rapid population growth overall.

photo: istock

Mother with baby in Uganda

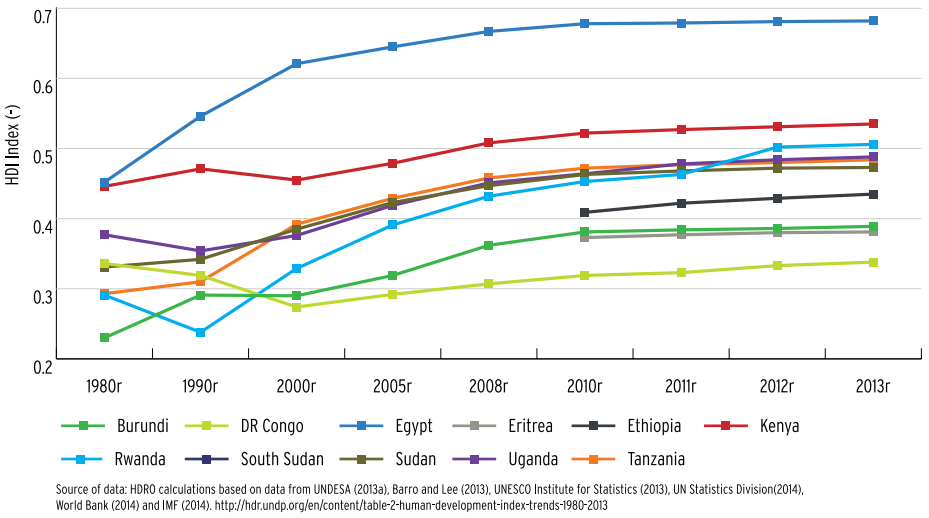
Life expectancy at birth compares the average number of years to be lived by a group of people born in the same year, if mortality at each age remains constant in the future. Life expectancy at birth is also a measure of overall quality of life in a country and summarizes the mortality at all ages.

For the Nile Basin countries, Egypt has the highest life expectancy (74 years), the rest of the Nile Basin countries have a life expectancy between 55 and 64 years.

SELECTED COUNTRY DEVELOPMENT INDICATORS

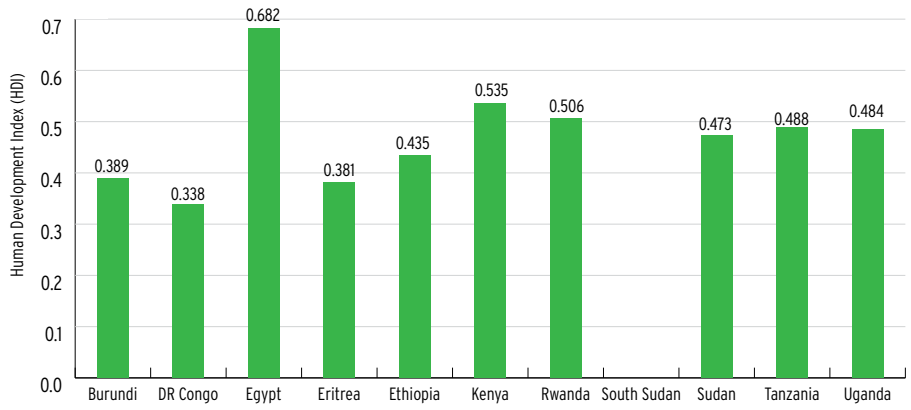
Human Development Index (HDI)

Human Development Index trends, 1980-2013



Source of data: HDRO calculations based on data from UNDESA (2013a), Barro and Lee (2013), UNESCO Institute for Statistics (2013), UN Statistics Division(2014), World Bank (2014) and IMF (2014). http://hdr.undp.org/en/content/table-2-human-development-index-trends-1980-2013

Human Development Index (HDI)



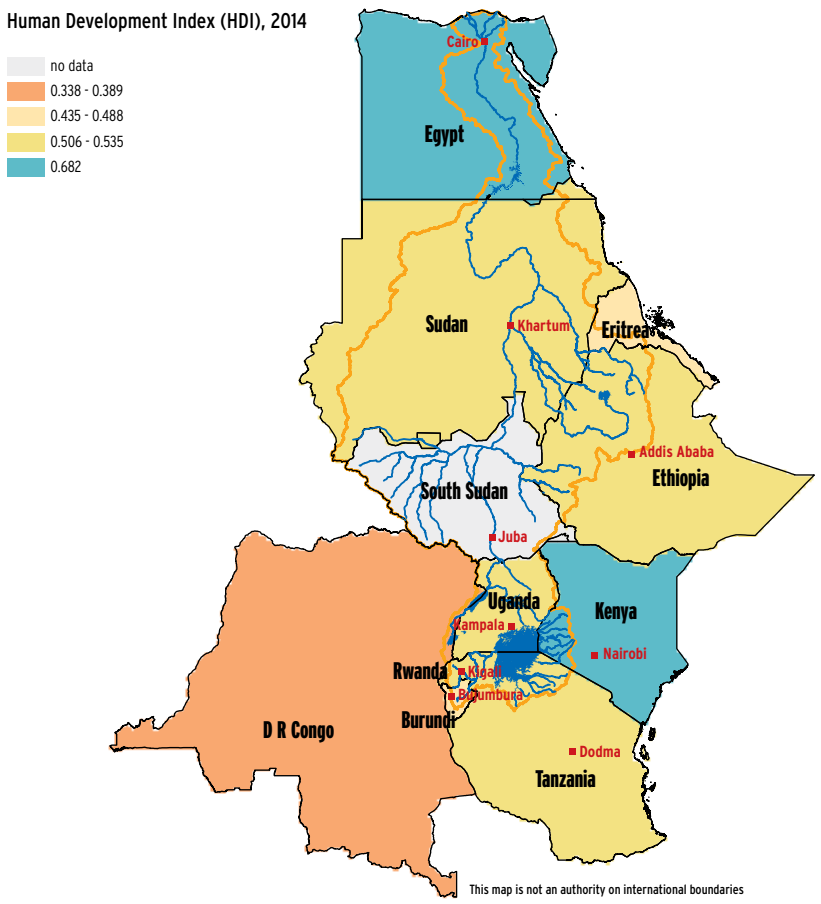
Source of data: HDRO calculations based on data from UNDESA (2013a), Barro and Lee (2013), UNESCO Institute for Statistics (2013), UN Statistics Division(2014), World Bank (2014) and IMF (2014). http://hdr.undp.org/en/content/table-2-human-development-index-trends-1980-2013

The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and having a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions.

All Nile Basin countries are in Low Human Development category with the exception of Egypt which is in Medium Human Development category.

Since 2000, all Nile Basin countries, however, have shown relatively rapid improvement in HDI.

Human Development Index (HDI), 2014



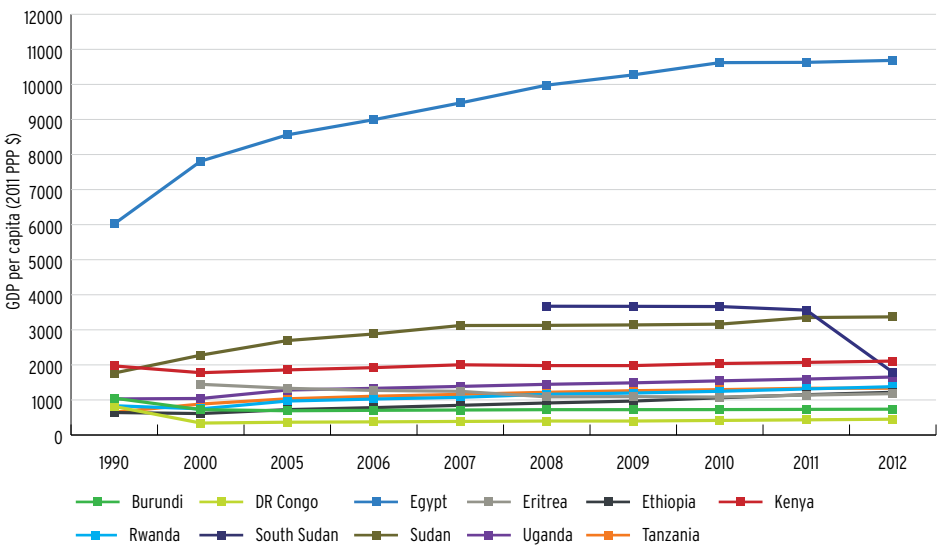
Gross Domestic Product

GDP per capita (PPP based) is gross domestic product converted to international dollars using Purchasing Power Parity (PPP) rates and divided by total population. Among Nile Basin countries, Egypt has the highest GDP per capita, followed by Sudan. DR Congo and Burundi have the lowest Gross National Income (GNI) per capita is defined as the sum of value added by all producers who are residents in a nation, plus any product taxes (minus subsidies) not included in output, plus income received from abroad such as employee compensation and property income divided by the population. In 2014 Egypt and Sudan had the highest GNI per capita.

The data show where production takes place in an economy. The distribution gives the percentage contribution of agriculture, industry, and services to total GDP. Agriculture includes farming, fishing, and forestry. Industry includes mining, manufacturing, energy production, and construction. Services cover government activities, communications, transportation, finance, and all other private economic activities that do not produce material goods.

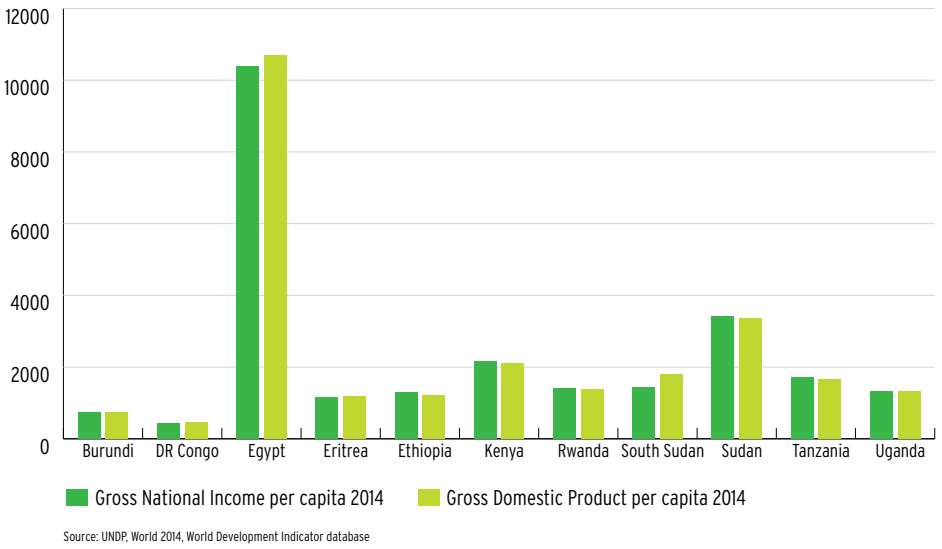
About 20% of Nile Partner states GDP is generated by agriculture. Agriculture still dominates the economy of many countries in the region. With structural transformation and industrialization, this contribution could change. Egypt has the highest per capita income (2011 PPP $ 2013) of US$ 10,733, almost 15 times larger than Burundi which has the lowest at US $747. Ethiopia had the highest real GDP growth rates at 8.5%.

Trends in GDP per capita in Nile Basin countires



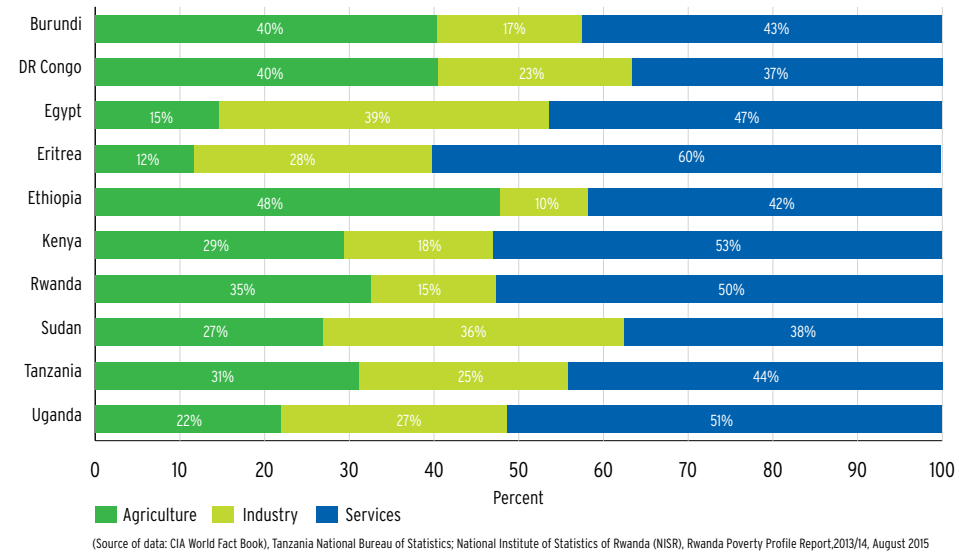
Source: UNDP, World 2014, World Development Indicator database

Gross Domestic Product and Gross National Income per capita (measured in 2011 PPP$)



Source: UNDP, World 2014, World Development Indicator database

Contribution of sectors to total GDP in Nile Basin countries (2014 estimate)



(Source of data: CIA World Fact Book), Tanzania National Bureau of Statistics; National Institute of Statistics of Rwanda (NISR), Rwanda Poverty Profile Report,2013/14, August 2015

Photo: Simone D. McCourtie / World Bank

Laborers from a land husbandry activity on steep hills. About 60% are women; Rwanda

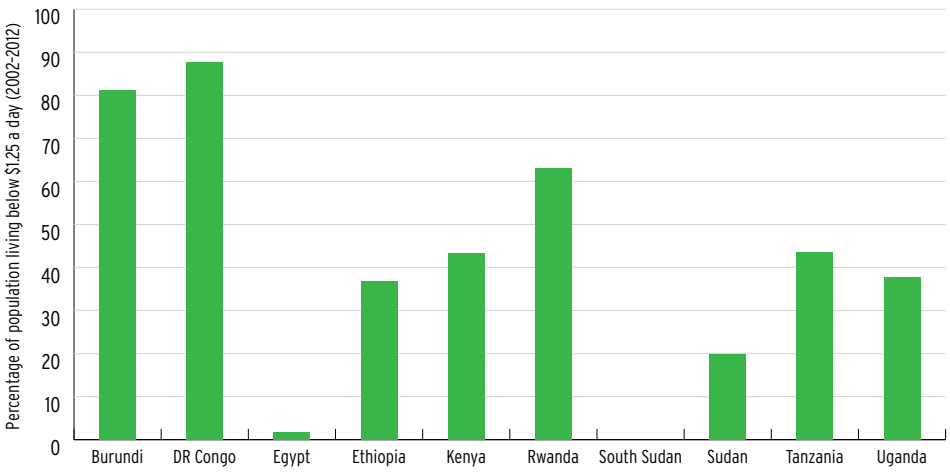
Poverty in the Nile Basin Countries

No matter how it is defined (e.g. lack of adequate income/consumption capacity; lack of wealth/assets including shelter, clothing, production assets; capability deprivation - education, health, skills, information; deprivation of capacity to influence decisions, etc.) poverty is widespread, and socio-economic conditions are difficult for a large majority of the Nile basin population. For example, by income alone, more than 40% of the population of most of the Nile basin countries lives on less than the international poverty line of 1.25 dollar a day (in purchasing power parity terms) PPP.

Population below PPP $1.25 a day shows the percentage of the population living below the international poverty line $1.25 (in purchasing power parity terms) a day. In five of the countries, the percentage of population below the PPP $ 1.25 a day is greater than 40 percent; greater than 60 percent in three countries.

Tackling such extreme levels of poverty is a policy priority of all Nile Basin countries.

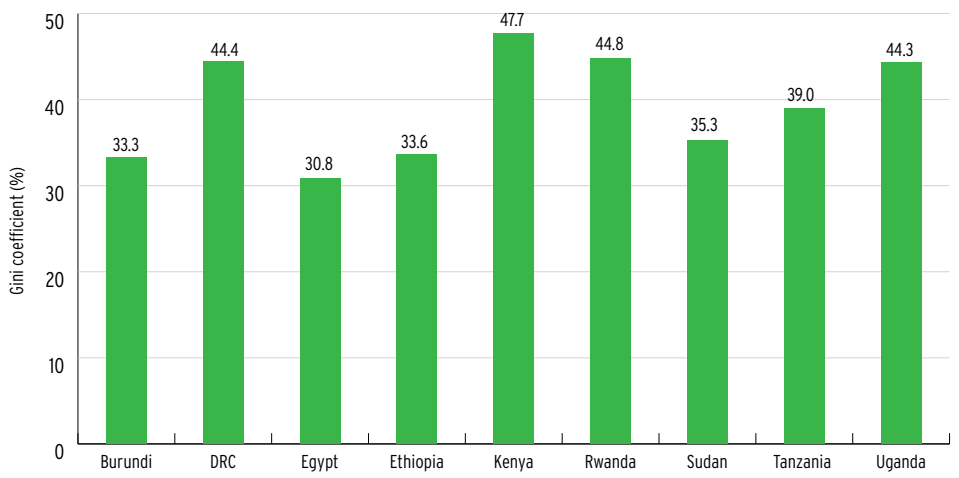
Population living below income poverty line



Source of data: UN, Human Development Report, 2015; no data for South Sudan

Economic Inequality

Gini coefficient of inequality (2003 - 2012) for Nile Basin Countries



Source of data: world Bank (2015); Tanzania National Panel Survey Wave 3, 2012-2013-National Bureau of statistics; National Institute of Statistics of Rwanda (NISR), Rwanda Poverty Profile Report,2013/14, August 2015

Gini coefficient is a measure of inequality. The coefficient varies between 0, which reflects complete equality and 100%, which indicates complete inequality (one person has all the income or consumption, all others have none).

The Gini coefficient is above 40 in four (Kenya, Rwanda, Uganda and DRC) out of nine Nile countries (no data are available for Eritrea, South Sudan), indicating substantial inequalities of income and wealth within these countries.

Where estimates are available, rural poverty incidence exceed urban poverty incidence. In terms of population below international poverty lines, again Burundi and DR Congo are the poorest at 81.3% and 87.7% respectively. Egypt has lowest $1.5 a day poverty incidence (1.7%) and the mean income shortfall is as low as half a percentage point. For $3 a day, poverty rates are understandably higher, although almost similar rankings hold.

Access to Potable Water and Sanitation

Over the last decade, thanks to commitment to the Millennium Development Goals, nearly all Nile Basin countries have made significant progress in providing safe drinking water to their urban population. However, the proportion of rural population with access to safe drinking water is low by international standards. Egypt is an exception where 99 percent of its rural population has access to safe drinking water.

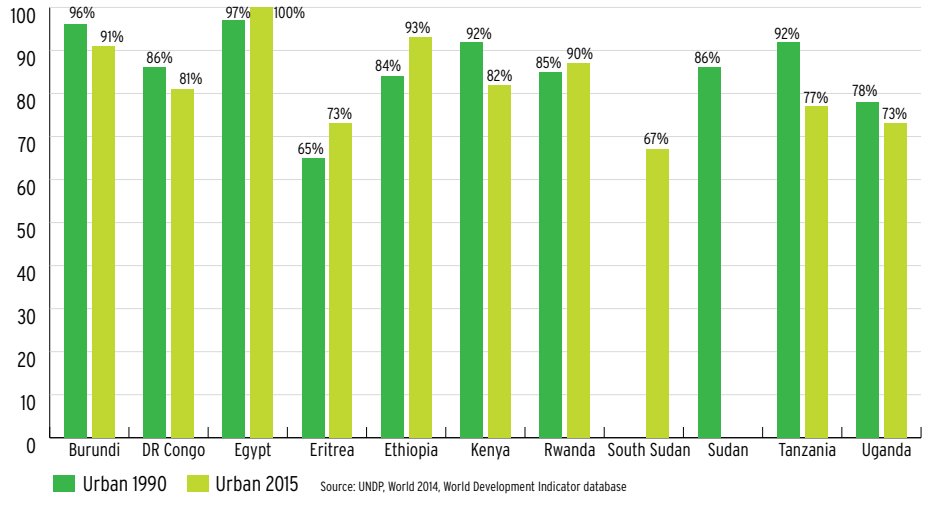
There have been noticeable improvements in providing access to improved sanitation facilities in urban areas. However, still in seven of the basin countries, only less than 50 percent of the urban population has access to improved sanitation services.

Nile Basin countries have made progress in improving access to improved sanitation facilities in rural areas as well. Even so, in seven of the basin countries, onlyless than 30 percent of the rural population has access to improved sanitation services.

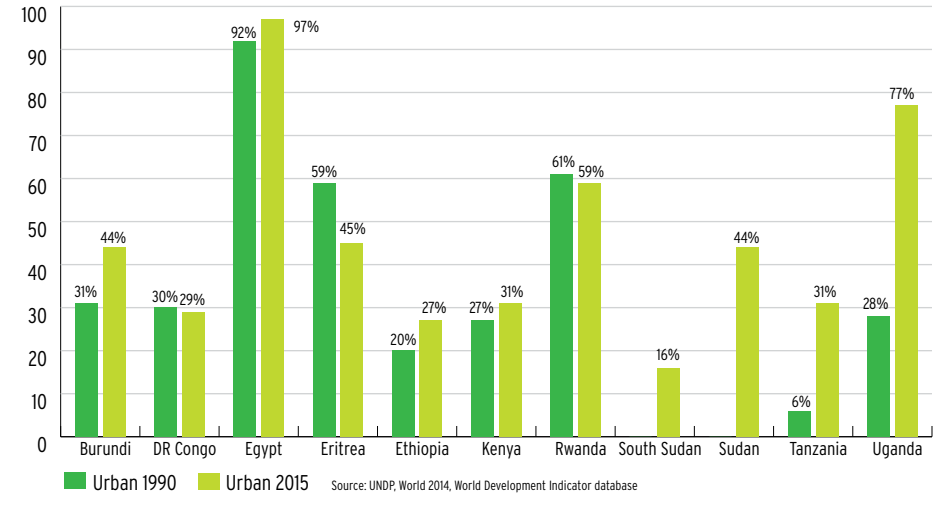
Photo: © Arne Hoel / World Bank

Lucia Boki fetches water at a borehole near the village of Bilinyang, near Juba

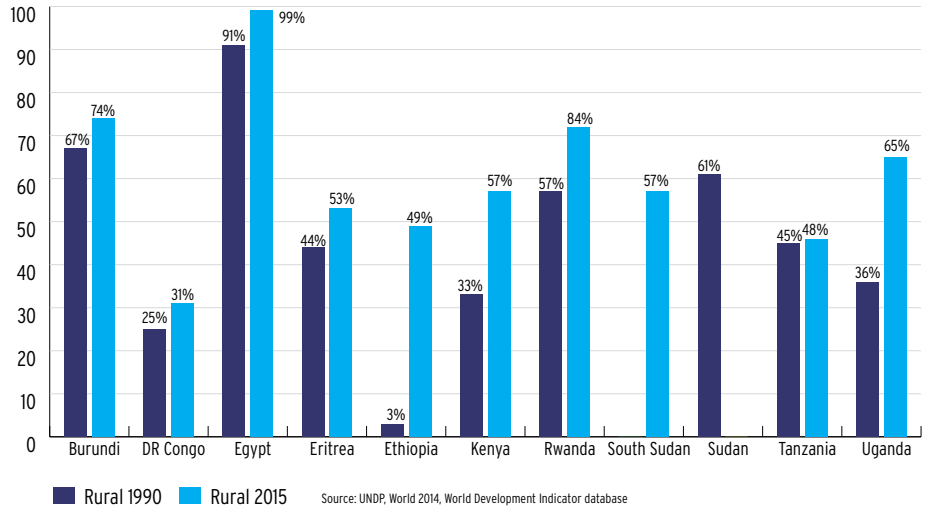
Access to potable water - Estimated percentage of urban population using improved drinking water sources



Access to sanitation - Estimated percentage of urban population using improved sanitation facility



Access to water - Estimated percentage of rural population with access to improved drinking water facilities



Access to sanitation - Estimated percentage of rural population using improved sanitation facilities

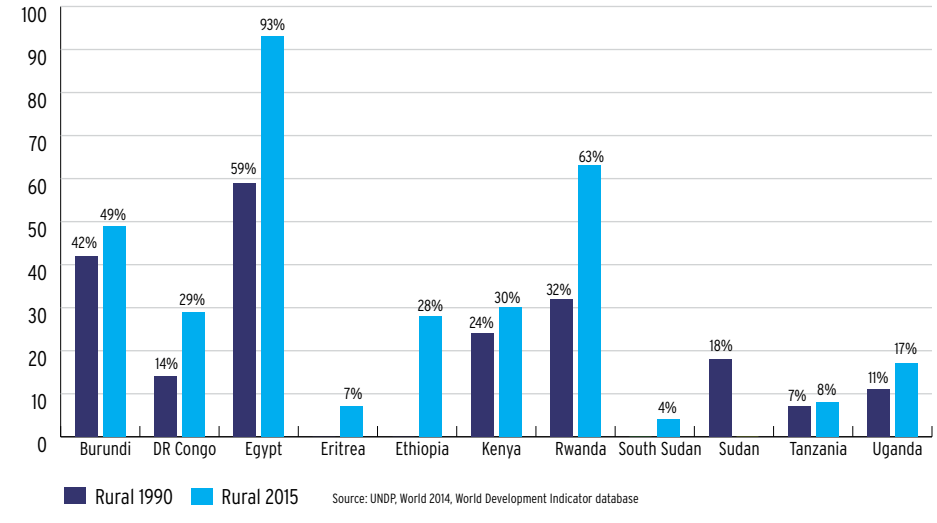
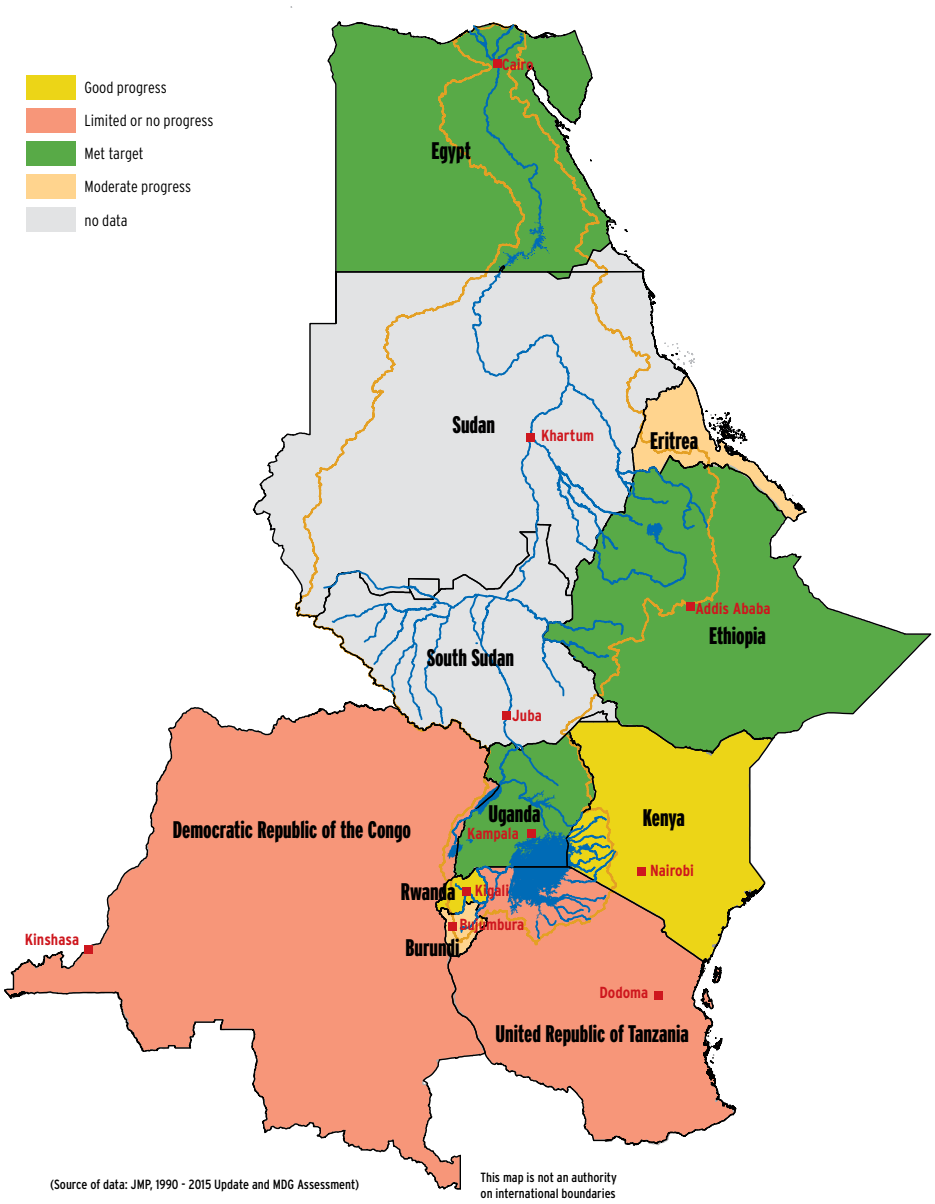


Photo: © Arne Hoel / World Bank

The renovated water treatment plant in Juba. South Sudan

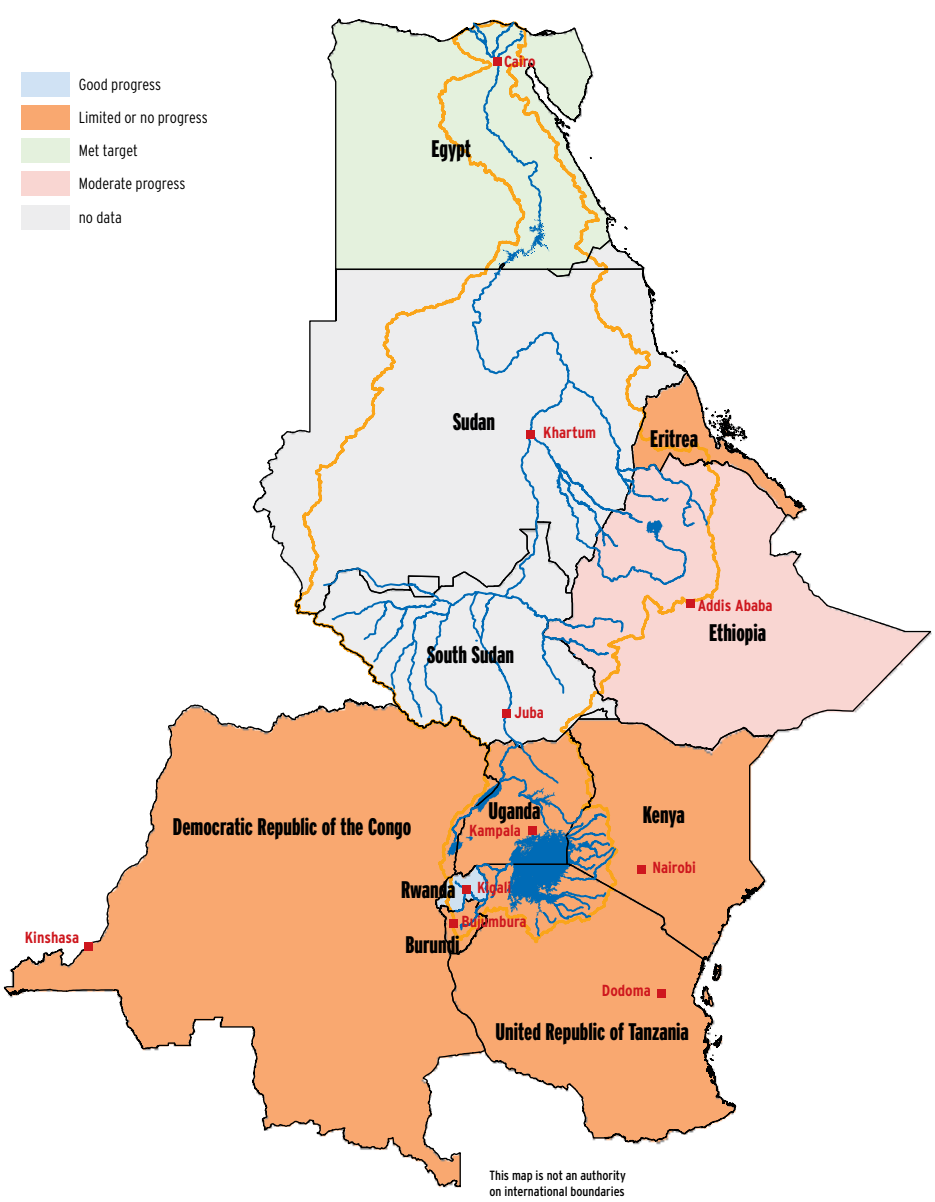
Achievement of MDG targets

Progress towards MDG targets for water supply
25 years progress (1990 - 2015)



(Source of data: JMP, 1990 - 2015 Update and MDG Assessment)

Progress towards MDG targets for sanitation
25 years progress (1990 - 2015)

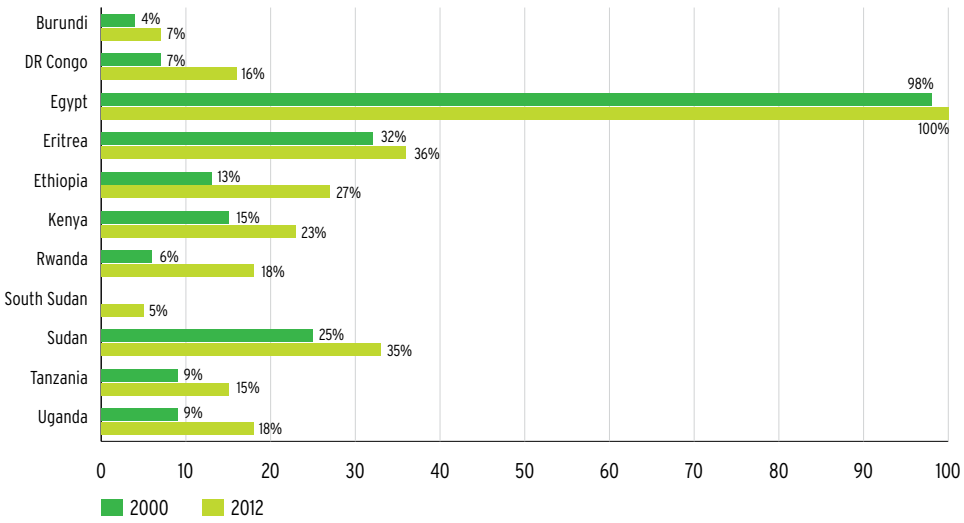


Level of electrification/access to electricity by country

In almost all Nile Basin countries, the percentage of population with access to electricity is very low by world standards. The exception is Egypt where all its population has access to electricity.

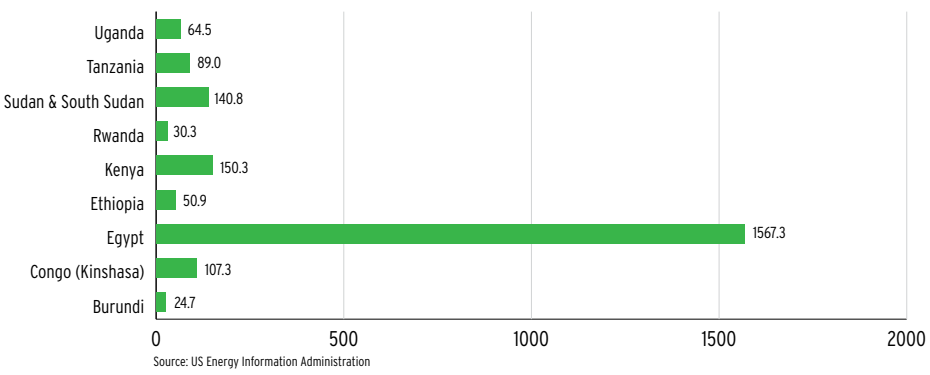
Per capita electricity consumption shows stark contrast. Again, Egypt is the exception. Egypt's per capita electricity consumption is more than double the combined per capita electricity consumption of 6 Nile Basin countries.

Percentage of population with access to electricity in Nile Basin countries



Source of data: World Bank, Sustainable Energy for All (SE4ALL) database from World Bank, Global Electrification database

Electricity net consumption (KWh/c), 2010



Source: US Energy Information Administration

photo: Istock

Power distribution

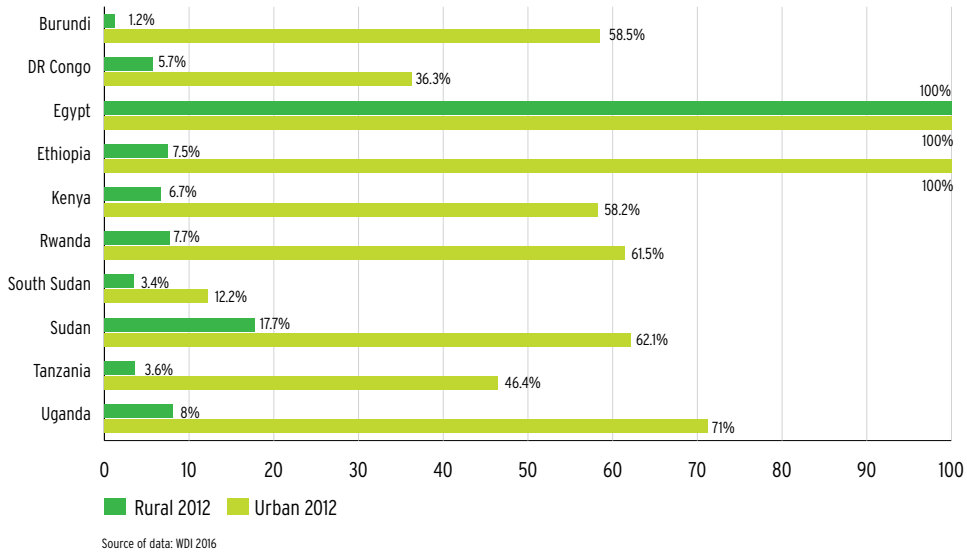
Level of electrification

Access to electricity is the percentage of population with access to electricity. Electrification data are collected from industry, national surveys and international sources.

The DR Congo, where only 16.4% of the population has access to electricity, is an example of the co-existence of huge hydropower potential with extreme energy poverty in the Nile Partner states. Political instability, limited access to investment finance, small market size and weak transmission connections with neighboring countries have all held back exploitation of hydro resources. Ethiopia, Kenya and Uganda are among the most populous countries in the Nile Basin and have the largest populations both with and without access to electricity. Rwanda's electrification rate has increased rapidly in recent years (from 6% in 2008 to 17% in 2012).

Nearly 80% of those lacking access to electricity across Nile Basin are in rural areas, an important distinction when considering appropriate energy access strategies and technical solutions. The problem of inadequate electricity supply is multifaceted: it includes inadequate generating capacity, rundown existing stock and limited transmission and distribution infrastructure. Within the Nile Basin, the number of people living without electricity is increasing, as rapid population growth is outpacing the many positive efforts to provide access.

Access to electricity (% of population)



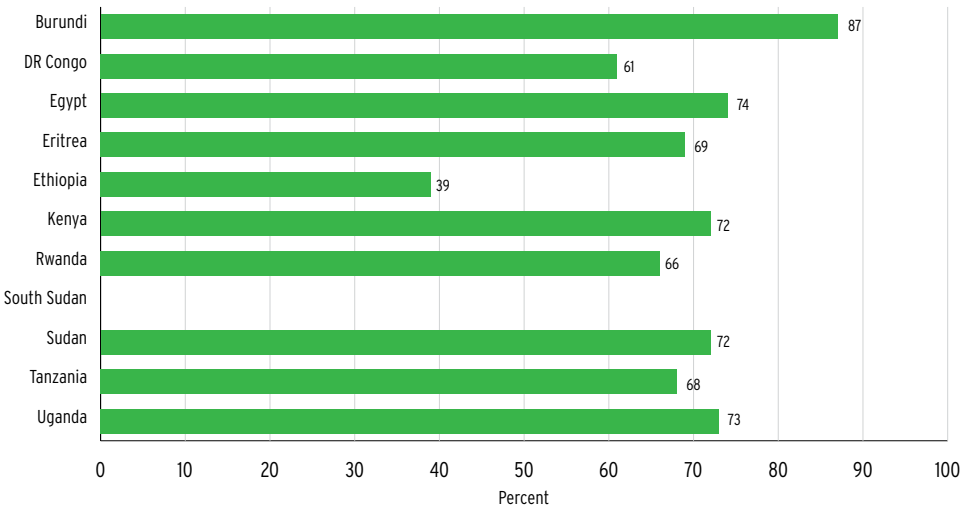
Source of data: WDI 2016

Education and literacy

Youth literacy rate reflects the outcomes of the primary education system over the previous 10 years, and is often seen as a proxy measure of social progress and improving capability for economic achievement. The rate represents the percentage of people aged 15 to 24 years who can both read and write with understanding of simple statements. Generally, 'literacy' also encompasses 'numeracy', the ability to make simple arithmetic calculations.Similar progress has been made in terms of adult literacy in the basin. Adult literacy here encompasses ages 15 and above for both sexes.

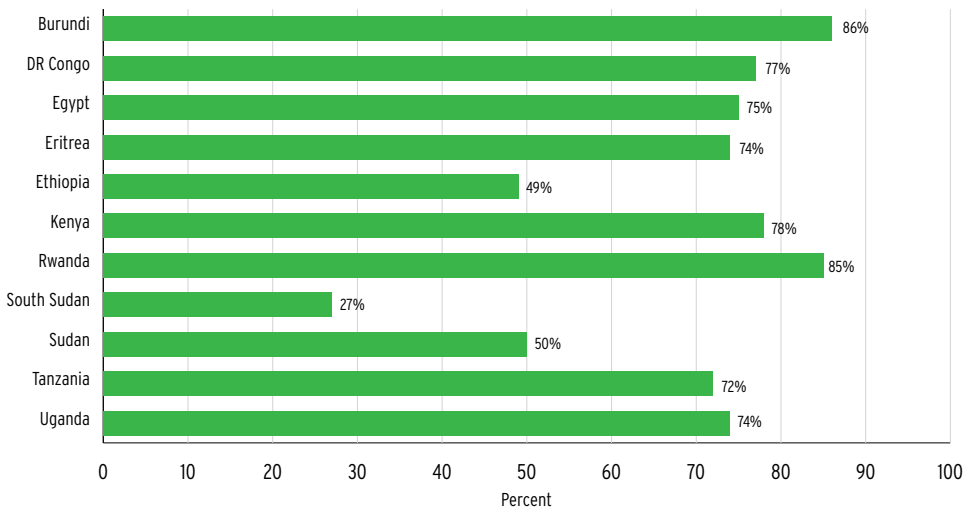
Education and literacy are key indicators of quality of human labor force. Overall, adult female illiteracy rates are higher than adult male illiteracy rates, and this holds for all countries. Again, male youth illiteracy rates are highest in Ethiopia, while Kenya has the lowest youth male and female illiteracy. With the only exception of Kenya, youth female illiteracy rates are higher than youth male illiteracy rates. This implies that females, in general, tend to be more illiterate than their male counter parts in all countries. A gender focused education strategy is therefore highly desirable for effectively engaging female into the socio-economic fabric and address gender inequities.

Adult literacy rate (% ages 15 and older)



Source of data: UNESCO Institute of Statistics database, National Institute of Statistics of Rwanda (NISR), Rwanda Poverty Profile Report,2013/14, August 2015; Tanzania National Bureau of Statistics, Tanzania in Figure, 2015; South Sudan Statistical Year Book, 2011; Sudan Central Bureau of Statistics, 2010

Youth literacy rate, population 15-24 years, both sexes (%)

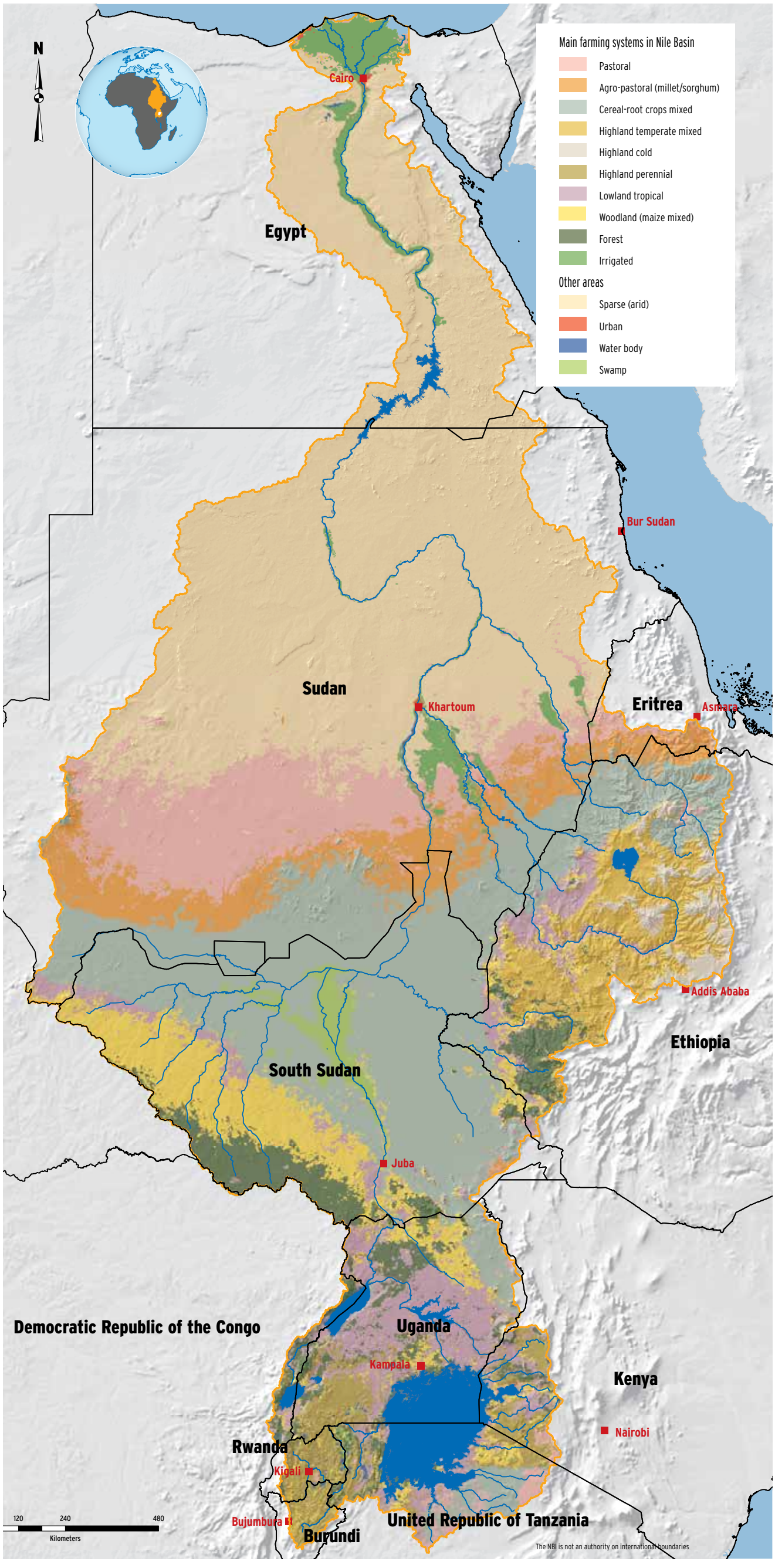


Source of data: UNESCO Institute of Statistics database, National Institute of Statistics of Rwanda (NISR), Rwanda Poverty Profile Report,2013/14, August 2015; Tanzania National Bureau of Statistics, Tanzania in Figure, 2015; South Sudan Statistical Year Book, 2011; Sudan Central Bureau of Statistics, 2010

photo: Istock

School going girls

FARMING SYSTEMS AND PRODUCTION IN NILE BASIN



The entire Nile Basin exhibits a wide spectrum of altitude, temperature, rainfall, humidity and aridity ranges, thus giving rise to diversity of agro-climatic zones and agriculture farming systems and a range of agricultural products thereof.

Farming System	Area Km²	Percentage
Pastoral	283791.1	8.9
Agro-Pastoral (millet/sorghum)	178584.0	5.6
Cereal -root crops mixed	675250.6	21.3
Highland temperate mixed	136932.2	4.3
Highland cold	38652.9	1.2
Highland perennial	89513.6	2.8
Lowland tropical	190886.3	6.0
Woodland (maize mixed)	203767.5	6.4
Forest	143307.9	4.5
Irrigated	66096.8	2.1
Sparse (Arid)	1033878.0	32.5
Urban	1838.1	0.1
Water Body	94882.1	3.0
Swamp	39072.3	1.2
Total	3176453.3	

Photo: Simone D. McCourtie / World Bank

Impressive land husbandry activity on a steep hills.

Photo: A'Melody Lee: World Bank

The Kitabi Tea processing facility in kitabi, Rwanda

Photo: A'Melody Lee: World Bank

Coffee washing station

Irrigated Farming System

This farming system comprises large scale, traditional, small scale traditional and commercial. In many cases, irrigated cropping is supplemented by rainfed cropping or animal husbandry (the Gezira is one notable exception). Crop failure is generally not a problem, but livelihoods are vulnerable to water shortages, scheme breakdowns and deteriorating input/output price ratios.

Photo: A Melody Lee: World bank

Rice paddies in the swamps and marshes maximise arable land, yielding food and economic security during the growing season

Forest Farming System

Farmers practice shifting cultivation; clearing a new field from the forest every year, cropping it for 2 to 5 years. Cattle and human population density are low. Physical isolation plus lack of roads and markets pose serious problems. Agricultural growth potential is moderate but development requires careful management of environmental risks, including soil fragility and loss of wildlife habitats.

Photo: A Melody Lee: World Bank

Rwanda's economic development can be traced to it's innovative landscape reform program. Communities terraced the hills and valleys during the dry season, so that they could retain topsoil, nutrients and water. This meant greater yields and more productive farming.

Highland perennial Farming System

This farming system is found in Ethiopia, Uganda, Rwanda and Burundi. The system supports the highest rural population density in the region. The farming system is based on perennial crops such as banana, plantain, and coffee, complemented by cassava, sweet potato, beans and cereals. The main trends are diminishing farm size and declining soil fertility.

Highland temperate mixed Farming System

This farming system is located at altitudes between 1800 and 3000 metres in the highlands and mountains of Ethiopia and smaller areas are found in Eritrea. Small grains such as wheat and barley are the main staples, complemented by peas, lentils, broad beans, rape, teff (in Ethiopia) and Irish potatoes. Typically there is a single cropping season, although some parts of Ethiopia have a second, shorter season. There are major problems in the farming system: for instance, soil fertility is declining because of erosion and a shortage of biomass; and cereal production is suffering from a lack of inputs. There is, however, considerable potential for diversification into higher-value temperate crops.

Cereal-Root Crops Mixed Farming System

This type of farming is found mainly in the dry sub-humid zone. Although the system shares a number of climatic characteristics with the Maize mixed system, other characteristics set it apart, namely; lower altitude, higher temperatures, lower population density, abundant cultivated land, higher livestock numbers per household, and poorer transport and communications infrastructure. Although cereals such as maize, sorghum and millet are widespread, wherever animal traction is absent root crops such as yams and cassava are more important than cereals. Intercropping is common, and a wide range of crops is grown and marketed. The main source of vulnerability is drought but the agricultural growth prospects are excellent.

Maize mixed Farming System

The farming system is the most important food production system in Kenya, Tanzania and Uganda, but also found in Ethiopia and South Sudan. The most typical areas have uni-modal rainfall, but some areas experience bimodal rainfall. The farming system also contains scattered irrigation schemes, but these are mostly small-scale. Where a bimodal rainfall pattern occurs farmers have two cropping seasons, but in drier areas they usually harvest only once a year from a given field. The main staple is maize and the main cash sources are cattle, tobacco, coffee and cotton, plus the sale of food crops such as maize and pulses. The main source of vulnerability is drought.

Agro-Pastoral millet/sorghum Farming System

For the Nile Basin countries, this system of farming is mainly found in Sudan, South Sudan, Ethiopia and Eritrea. Crops and livestock are of similar importance. Rainfed sorghum and pearl millet are the main sources of food and are rarely marketed, whereas sesame and pulses are sometimes sold. Livestock are kept for subsistence (milk and milk products), offspring, transportation (camels, donkeys), land preparation (oxen, camels), sale or exchange, savings, bride wealth and insurance against crop failure. The main source of vulnerability is drought, leading to crop failure, weak animals and the distress sale of assets. Agricultural growth potential is modest and presents important challenges.

Pastoral Farming System

This system is located in the arid and semi-arid zones extending from Sudan, Ethiopia and Eritrea. During the driest period of the year, Sahelian pastoralists move south to the Cereal-Root Crop Mixed System areas and they return north during the rainy season. The main source of vulnerability is the great climatic variability and consequently high incidence of drought.

Sparse (Arid) Farming System

The system is mainly found in Sudan and Egypt. It is of limited significance from the point of view of agriculture. Because the wadis and their surrounding areas are considered part of the Pastoral Farming System, grazing within the actual Sparse (Arid) System is limited. There are some scattered irrigation settlements in these arid areas, in most cases used by pastoralists to supplement their livelihoods.

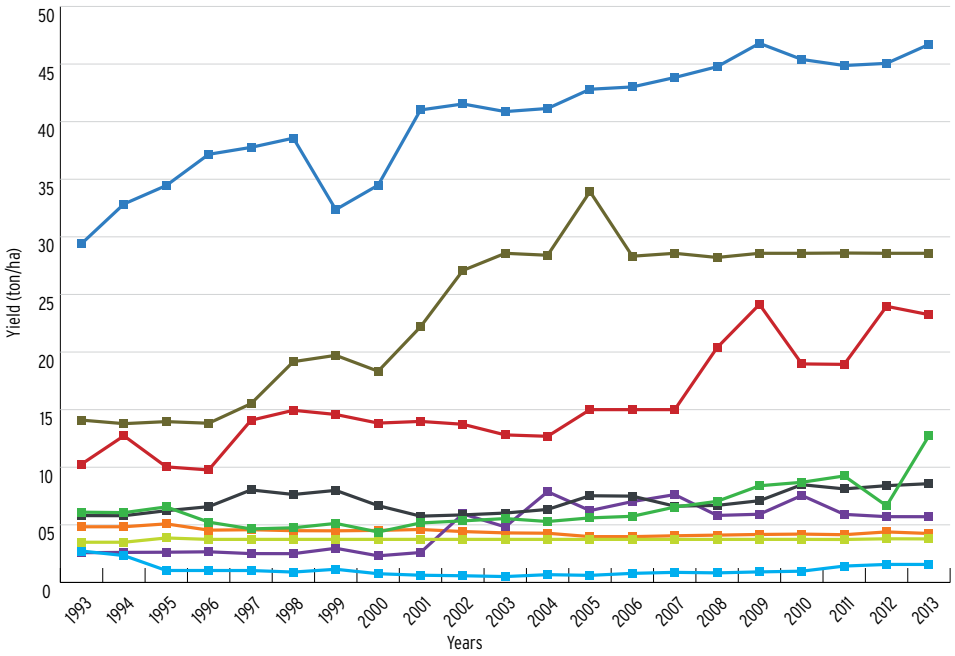
Agriculture Production and Yield

Agriculture is a major livelihood source in the Nile Basin, sustaining tens of millions of people. It provides occupations for more than 75 per cent of the total labour force and contributes to one-third of the GDP in the basin (IWMI, 2012). Enhancing agriculture could directly contribute to poverty alleviation in the region as most of the poor live in agricultural areas, and are therefore largely reliant on agriculture as their primary (and often only) source of income and living. Increased agricultural production can also be effective to reduce the cost of living for both rural and urban poor through reduced food prices (OECD,2006).

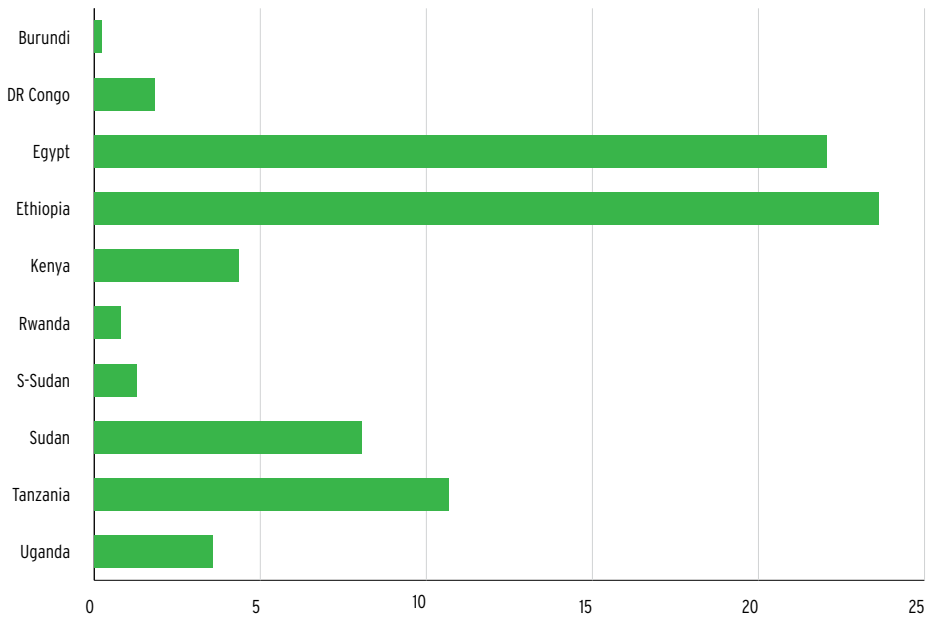
Countries and settings within the Basin exhibit considerable variability in terms of their livelihood sources, though dominant sectors of employment/income remain the same for all countries. For example, agriculture sector contributes over 40% of the value added to GDP in Ethiopia, Sudan, Burundi, Tanzania and Rwanda and in the vicinity of 40% in Kenya, Uganda, and Congo DR and slightly above 10% in Egypt.

Food production in most of the Nile Basin Partner states have not kept pace with the population increase over the past four decades. As a result, the Nile basin is the one region where per capita food production saves for Egypt is roughly constant at a level that is less than adequate. And much of the agriculture is not commercially oriented and is characterized by small landholdings, low inputs use, and low crop yields. Agricultural support services including input supply, credit, agro-processing, and marketing channels are poorly developed, which along with other multiple market failures, discounts returns to agriculture (value added per worker).

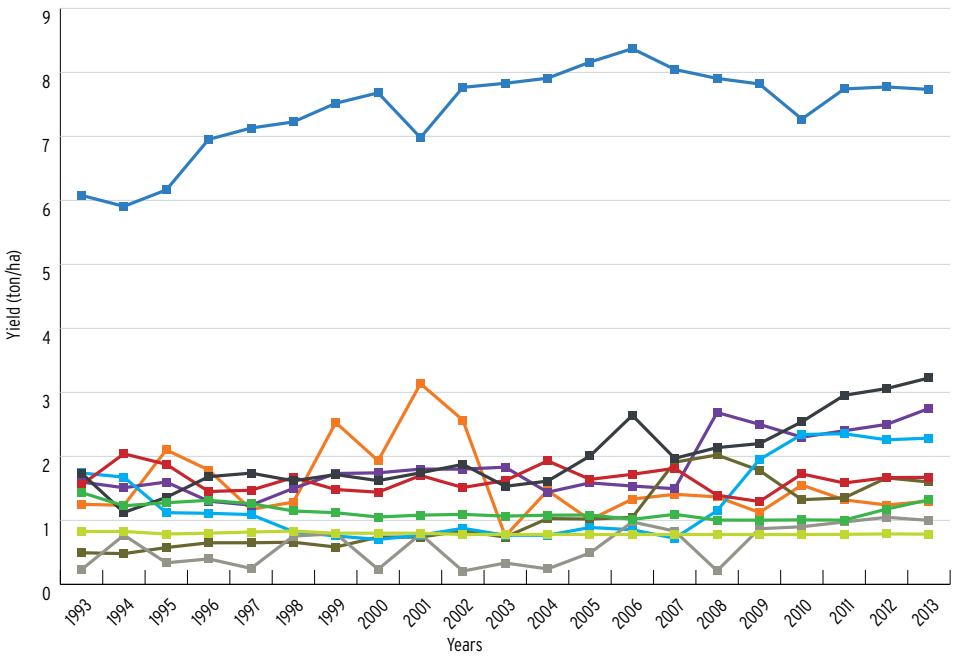
Yield - Bananas



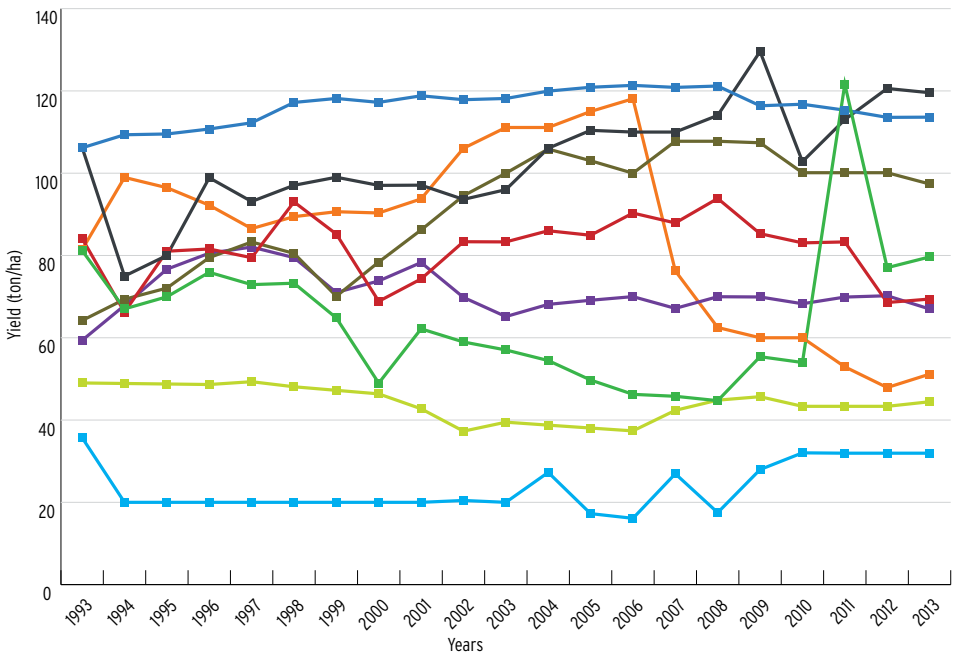
Cereal production (Millions metric tons)



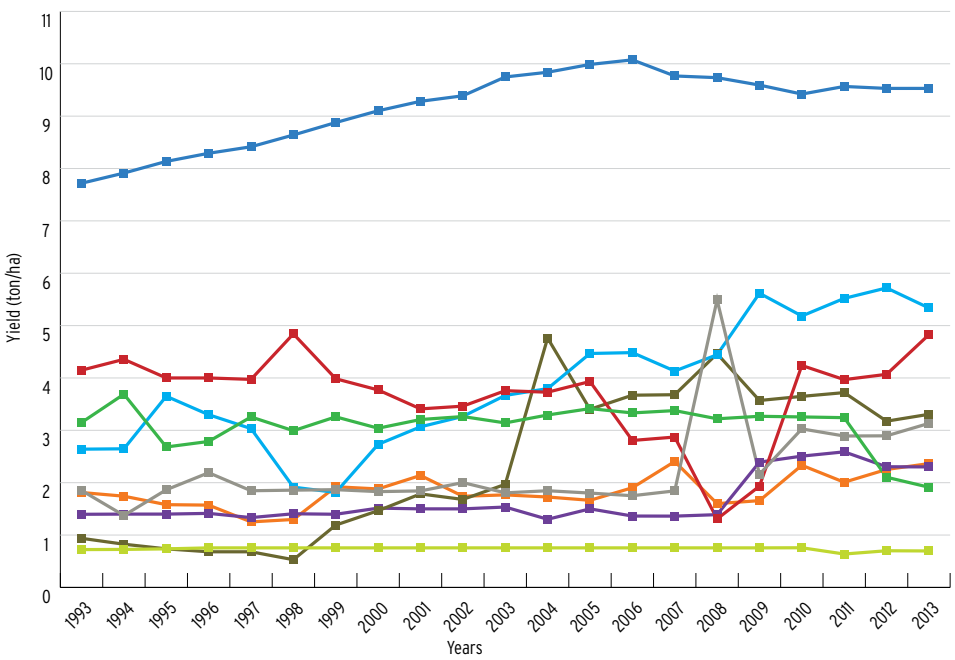
Yield - Maize



Yield - Sugarcane



Yield - Rice (Paddy)



Yield - Wheat

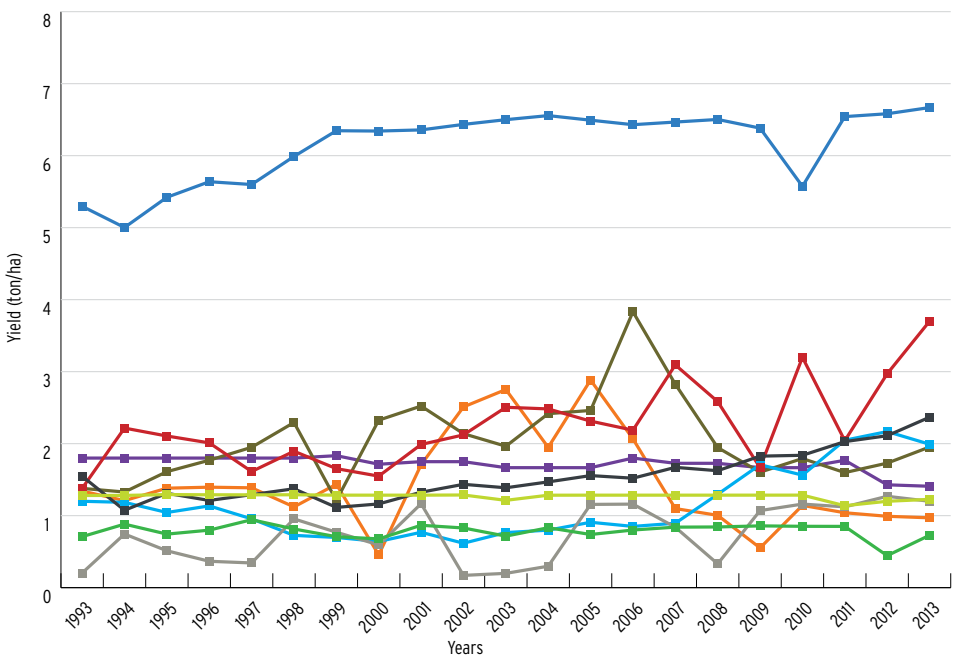


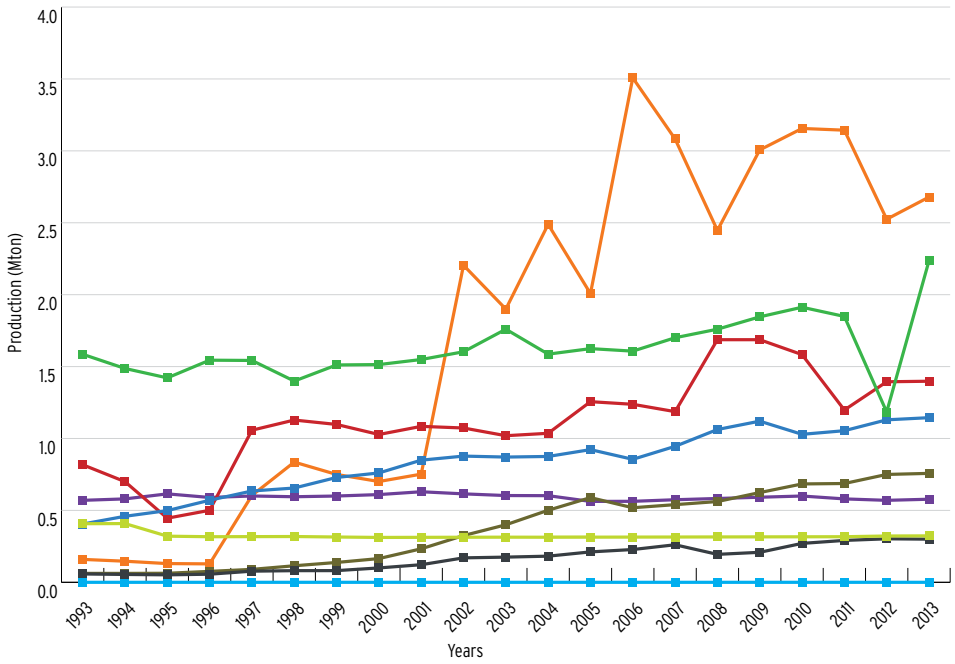
Photo: © Arne Hoel / World Bank

Corn after harvest

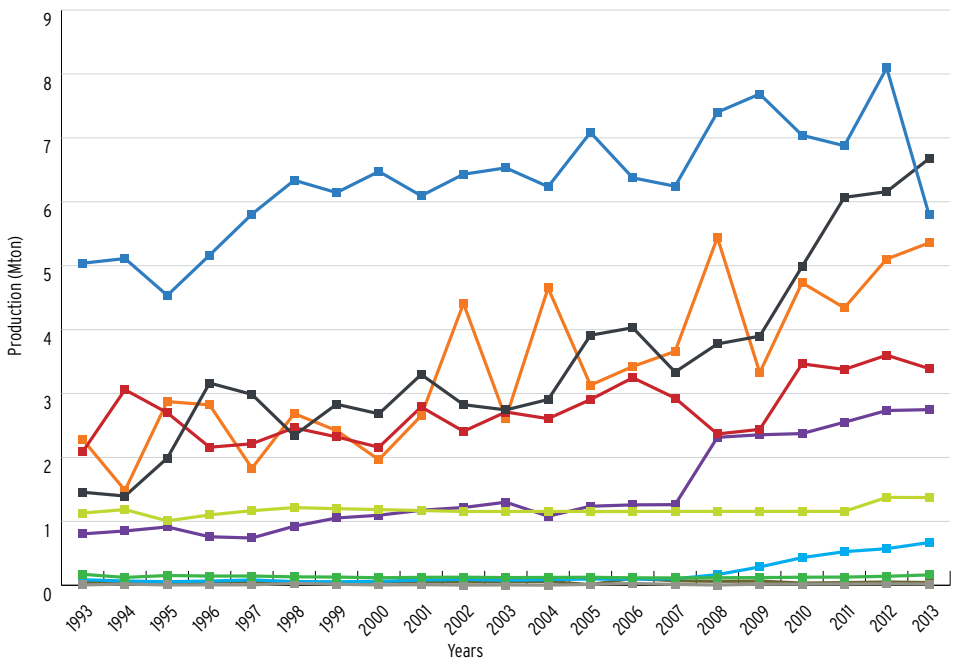
Photo: A'Melody Lee: World Bank

Improvements at the Kigali Seed Plant have allowed the plant to meet the increased demand that has resulted from greater productivity on farms in Rwanda.

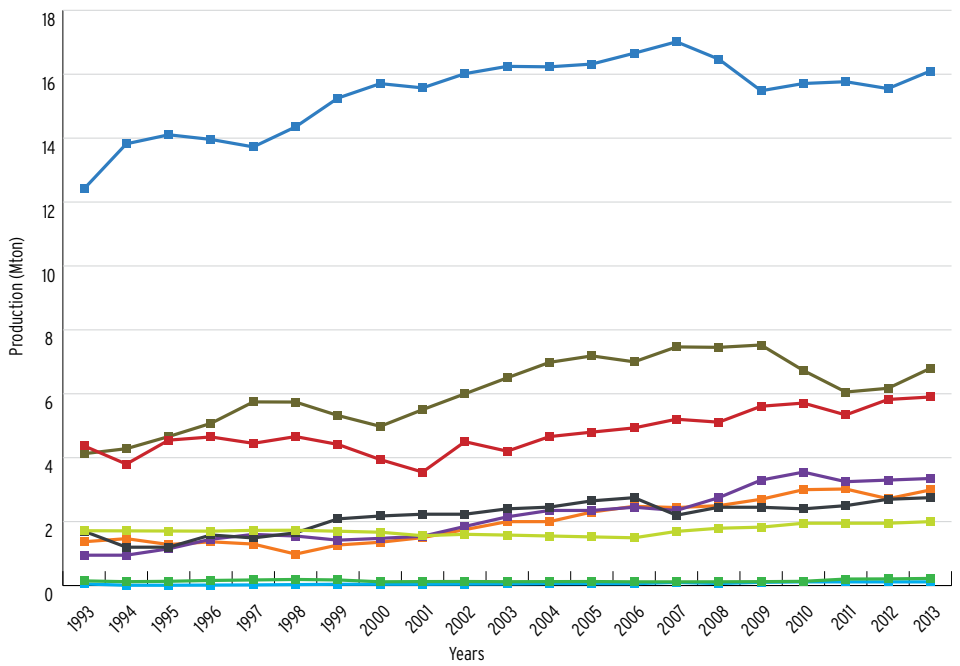
Production - Bananas



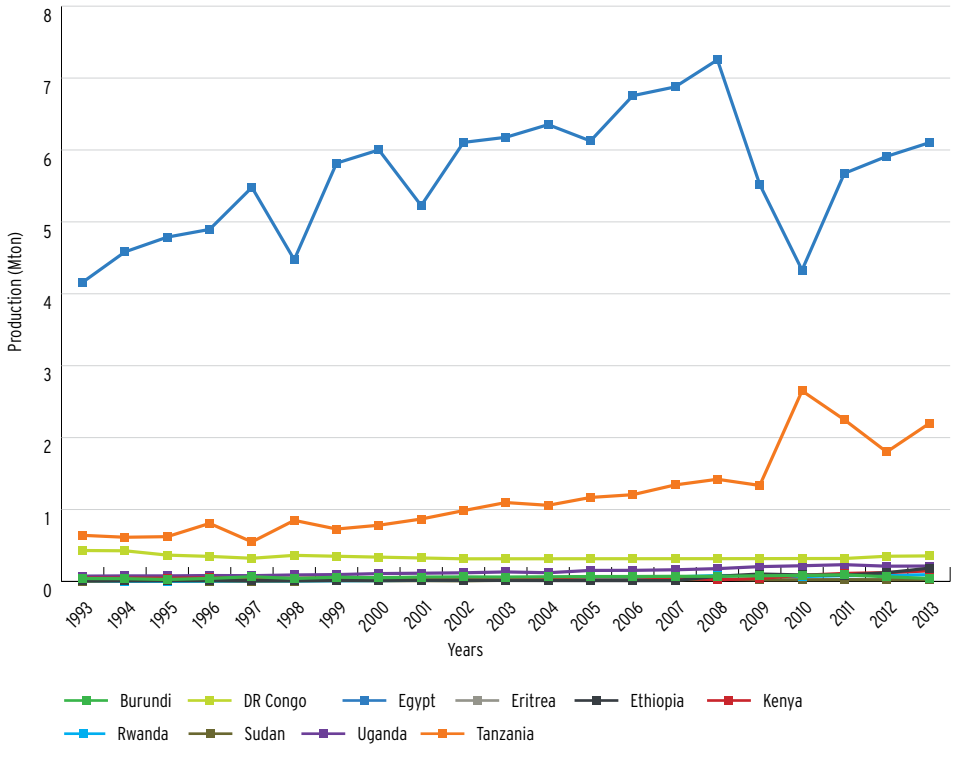
Production - Maize



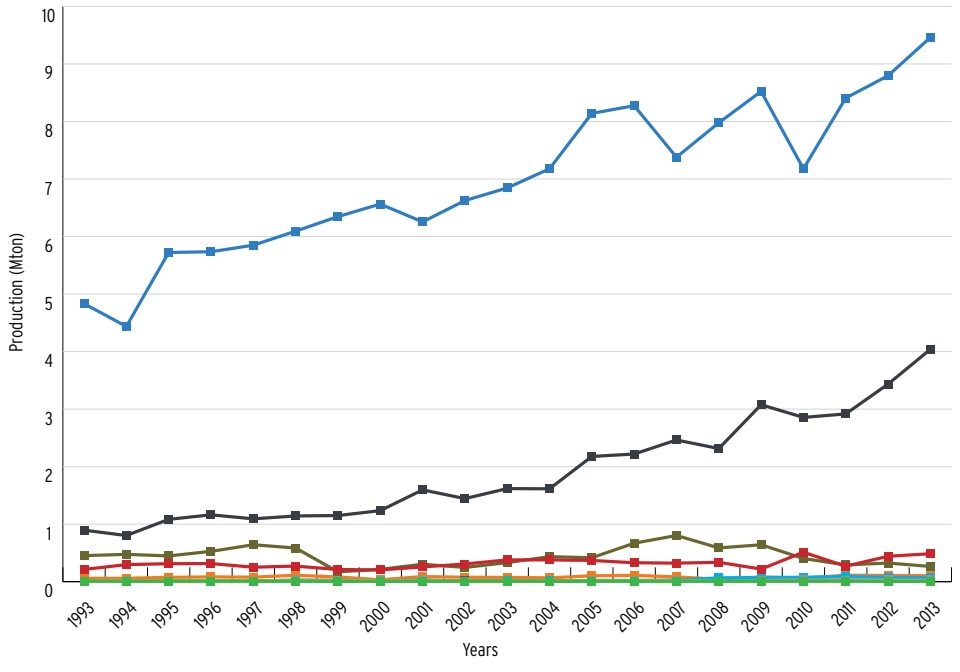
Production - Sugarcane



Production - Rice (Paddy)



Production - Wheat

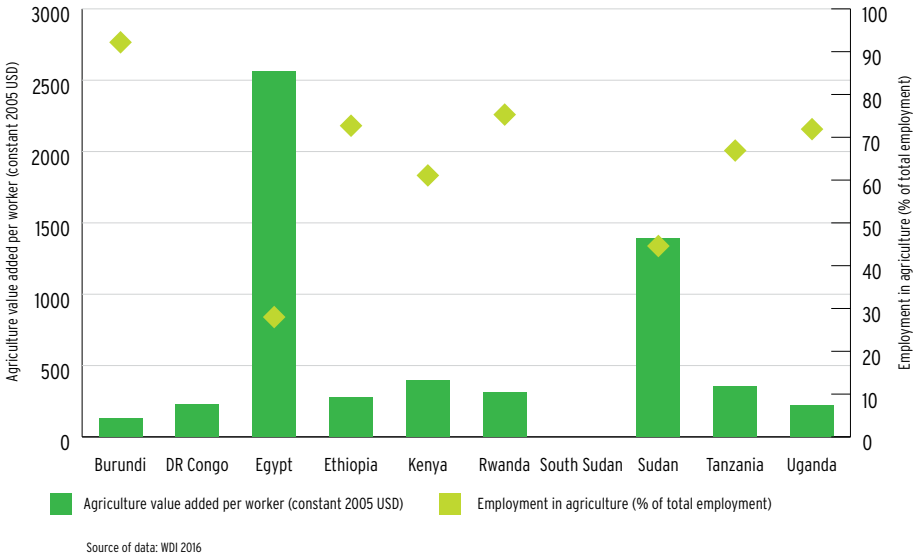


Agricultural labor force and agricultural productivity

Crop production and livestock husbandry account for about half of household income in the Nile basin partner states. Most of the Nile partner states are overwhelmingly rural, and the agriculture sector employs a large proportion of total labor force. As example, the agriculture sector employment accounts for 70 to 90% of total employment in Burundi, Ethiopia, Rwanda, Tanzania, and Uganda. Likewise, agriculture sector employs around 80 to 90% of female labor force in those countries, plus Congo. Also, with the exception of Ethiopia and Kenya, agriculture sector accounts for higher proportion of female employment than male employment, which implies that women are heavily dependent on agriculture sector for their employment security.

The poorest members of society are those who are most dependent on agriculture for jobs and income. Average agricultural value added per worker is low in many of the Nile partner states (lowest in Burundi (US$ 132 and Highest in Egypt (US$ 2561), reflecting a low degree of mechanization and limited penetration of improved seeds and inputs such as fertilizers. As agriculture sector value added per worker is a measure of agriculture sector productivity/efficiency, it implies that agriculture sector in the Nile Partner States is least efficient, which points to capacity constraints, underemployment, low productivity, market distortions, and poor infrastructure in these overwhelmingly drought-prone and water scarce countries. Therefore, agricultural productivity enhancing technologies and interventions are likely to be pro-gender and pro-poor, simultaneously.

Agricultural Labor Force and Agricultural Productivity (2015)



Source of data: WDI 2016

Photo: A'Melody Lee, World Bank

The Kitabi Tea processing facility in kitabi, Rwanda

AGRICULTURAL TRADE

The Nile Basin countries including Burundi, DR Congo, Egypt, Ethiopia, Kenya, Rwanda, South Sudan, Sudan, Tanzania and Uganda are endowed and produce agricultural commodities in all categories of (i) Industrial crops such as coffee, tea, sugar cane and perennial nuts such as cashew nuts; (ii) cereals and pulses such as maize, rice, wheat, beans, millet, sorghum, and nuts such as ground nuts, etc (iii) fruits and vegetable such as mangoes, oranges, pineapples and vegetables such as onions, tomatoes etc (iv) livestock and livestock products such as on-hoof cattle, sheep, goats, chicken and animal products of meet, milk, eggs, etc. (v) root tubers such as cassava, yam etc.

Photo: istock

Fruit and vegetable display outside a shop

Production

The large scale production either rain-fed or irrigated are mainly exportables for export earnings, while small scale production that are mainly rain-fed with minimal irrigation are for home consumption and only traded at local markets when there is surplus during seasons of over-production.

Nile Basin countries' policies

Nile Basin countries' policies on trade in agricultural in puts and outputs markets have a direct impact on products and productivity, as well as on the spatial distribution arbitrage from production (surplus) to consumption (deficit) areas. They affect trade at all levels, starting from where production takes place, to the national level, and the inter-regional trade among neighbouring countries, to the international trade in food commodities.

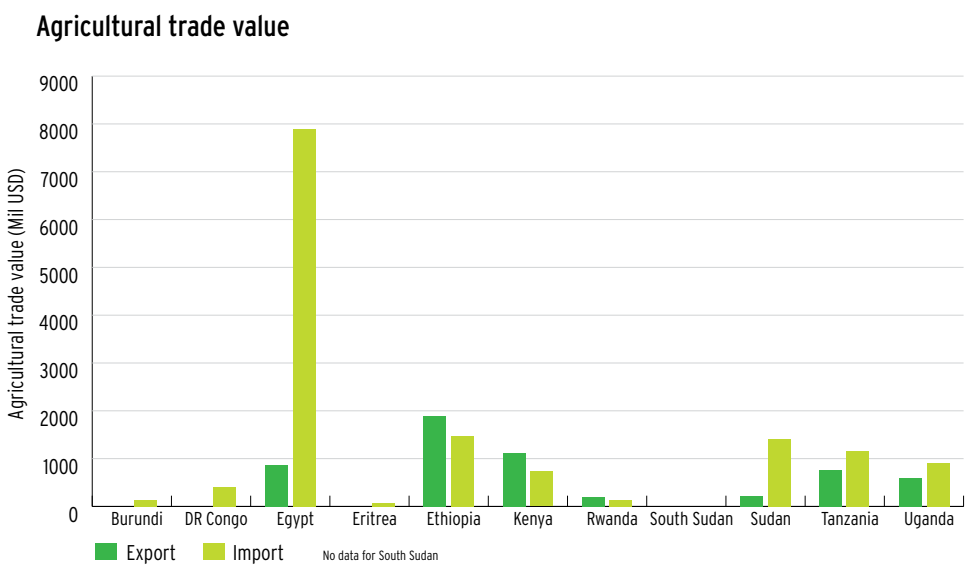
The agricultural trade policies in the Nile Basin region indicate that countries in the region have agricultural trade policies mainstreamed in key policies at the regional level and at national level. At the regional level, the COMESA with 9 Nile basin countries, EAC with 6 Nile Basin counties and SADC with 2 Nile Basin countries, regional policies of liberalization are the main trade policies impacting on intra and extra regional agricultural trade. At the national level, countries have agricultural trade policies mainstreamed in various agricultural policies and strategies. Countries have measures and also take decisions that affect trade in food and agricultural products. The national agricultural policies generally aim at alleviating poverty, promoting food and nutrition security, promoting commercialization of smallholder agriculture, generating foreign exchange, and increasing agricultural production and productivity.

Food security

The 'issue of food security' has remained on the national, regional and global development agenda of our times. Hunger has remained one of the leading causes of death globally, about 925 million people do not have enough food to eat, women although accounting to a slightly over half of the world's population, account for over 60 percent of the worlds hungry and one out of every four children in the world is undernourished. About 13 percent of the world population is undernourished, with the majority of the undernourished persons living in developing countries, some of which are members of the Nile Basin.

Key food export commodities

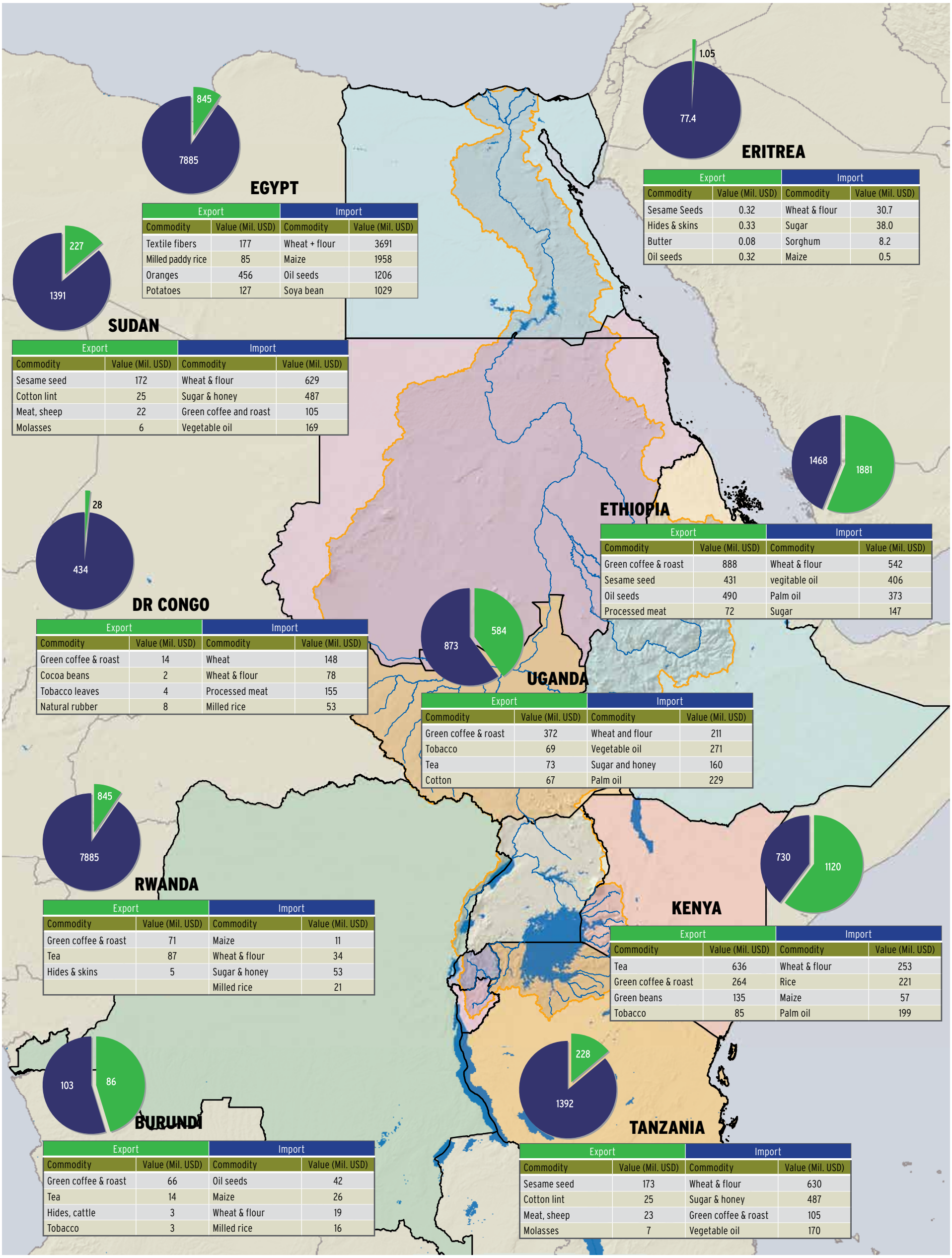
Among key food export commodities (according to the Common Market for Eastern and Southern Africa (COMESA) COMTrade) from the region are vege-



	Exports Agricultural Products Among the Top 5 Exports		IMPORTS Agricultural Products Among the Top 5 Imports		Top 5 Export and Import Partners (Nile Basin Countries Among the top)
Country	**Commodity**	**US$ Thousands**	**Commodity**	**US$ Thousands**	
BURUNDI (2014)	Coffee, not roasted	51,604	Spelt, common wheat	19,037	DR Congo Kenya
	Black tea (fermented)	13,471			
DR CONGO					
EGYPT (2014)			Maize (excl. seed)	1,942,736	
ETHIOPIA (2014)	Coffee (not roasted)	1,023,583	Palm oil (excl. crud)	447,805	
	Sesamum seeds	714,545			
	Fresh cut flowers	610,431			
	Other vegetables	567,521			
KENYA (2013)	Black tea (fermented)	1,202,918	Crude palm oil	496,464	Uganda, Tanzania
	Fresh cut flowers	477,889			
	Coffee (not roasted)	189,568			
RWANDA (2013)	Coffee (not roasted)	58,341			Tanzania, DR Congo, Uganda, Kenya
	Black tea (fermented)	37,946			
SOUTH SUDAN					
SUDAN (2012)	Live sheep	283,035	Cane or beet sugar	276,822	Egypt Arab Rep.
	Sesamum seeds	187,171			
TANZANIA (2013)	Cashew nuts	188,173	Spelt, common wheat	305,168	DR Congo
	Coffee (not roasted)	160,405			
UGANDA	Coffee, not roasted ...	424,456	Cane or beet sugar	115,436	Kenya, DR Congo, Sudan Rwanda, South Sudan
	Fresh or chilled fish ...	95,614	Palm oil (excl. crud)	110,910	
	Tobacco, partly or w ...	84,113			

Source: UN COMTRADE

Agricultural Trade for the Main Crops



EGYPT

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Textile fibers	177	Wheat + flour	3691
Milled paddy rice	85	Maize	1958
Oranges	456	Oil seeds	1206
Potatoes	127	Soya bean	1029

SUDAN

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Sesame seed	172	Wheat & flour	629
Cotton lint	25	Sugar & honey	487
Meat, sheep	22	Green coffee and roast	105
Molasses	6	Vegetable oil	169

ERITREA

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Sesame Seeds	0.32	Wheat & flour	30.7
Hides & skins	0.33	Sugar	38.0
Butter	0.08	Sorghum	8.2
Oil seeds	0.32	Maize	0.5

DR CONGO

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Green coffee & roast	14	Wheat	148
Cocoa beans	2	Wheat & flour	78
Tobacco leaves	4	Processed meat	155
Natural rubber	8	Milled rice	53

ETHIOPIA

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Green coffee & roast	888	Wheat & flour	542
Sesame seed	431	vegitable oil	406
Oil seeds	490	Palm oil	373
Processed meat	72	Sugar	147

UGANDA

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Green coffee & roast	372	Wheat and flour	211
Tobacco	69	Vegetable oil	271
Tea	73	Sugar and honey	160
Cotton	67	Palm oil	229

RWANDA

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Green coffee & roast	71	Maize	11
Tea	87	Wheat & flour	34
Hides & skins	5	Sugar & honey	53
		Milled rice	21

KENYA

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Tea	636	Wheat & flour	253
Green coffee & roast	264	Rice	221
Green beans	135	Maize	57
Tobacco	85	Palm oil	199

BURUNDI

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Green coffee & roast	66	Oil seeds	42
Tea	14	Maize	26
Hides, cattle	3	Wheat & flour	19
Tobacco	3	Milled rice	16

TANZANIA

Export		Import	
Commodity	Value (Mil. USD)	Commodity	Value (Mil. USD)
Sesame seed	173	Wheat & flour	630
Cotton lint	25	Sugar & honey	487
Meat, sheep	23	Green coffee & roast	105
Molasses	7	Vegetable oil	170

THIS MAP IS NOT AN AUTHORITY ON INTERNATIONAL BOUNDARIES

Source of data: FAO, 2012

tables, fruits and nuts, tea and coffee. Major exporters of vegetables and fruits from the region in 2012 were Egypt with 70.3%, Kenya with 14.5%, and Ethiopia with 6.9%, of the total in the region. Coffee exporting countries are mainly Ethiopia, Uganda and Kenya. Whereas coffee produced in Burundi and Ethiopia is mainly Arabica, Robusta accounts for over 85 % of Uganda's coffee output. In 2012, coffee earnings in Ethiopia, Africa's biggest producer, were worth US$ 825 million, a slight drop from the 2011 level of US$ 834 million. Ethiopian coffee exports were mainly destined to markets outside the Nile basin, in fact outside Africa such as Germany, Saudi Arabia, Belgium, USA and a number of other countries within the EU. On the other hand, Uganda's exports of coffee during the same period were worth over US$ 371 million, down from US$ 435 million earned the previous year and this coffee was mainly exported to Sudan within the Nile Basin and outside the basin to Switzerland and Germany. Generally, most of the exports are to destinations outside the Nile Basin region.

Photo: istock

Kenyan Fair Trade coffee Farmer

In the case of tea, major exporters of this produce from the Nile Basin region are Kenya, and Uganda. Kenya's exports of tea in 2012 were worth almost US$ 1.2 billion, mainly to the export markets of Egypt in the Nile Basin and to Pakistan the United Kingdom and Afghanistan markets outside the Nile Basin. Uganda exported tea worth US$ 50 million in 2012.

Local trade

The Nile Basin region grows staple crops, such as oilseeds, groundnuts, beans, cassava, sesame, maize, and rice, in addition to fruits and vegetables such okra, tomatoes, onions, and cabbages. Much of the production is for home consumption, although there are both local markets and cross border trade takes place. Much of the trade is informal or un-recorded between the communities in the countries. Trade is mainly women traders selling agricultural products in markets; however, only few of these women market their own produce, much of the produce is bought across the borders from other countries. However, according to FAO/WFP Crop and Food Security Assessment Mission (2014), countries or parts of countries of the Nile Basin register food deficits. Much cross border trade both formal and informal is of cereals moving through grain corridors to fill-in deficits. The food and livestock markets in the countries are highly fragmented as a consequence of the poorly developed road network. Livestock such as cattle and small ruminants (sheep and goats) are thriving in the region and form part of the livelihood enhancement. Marketing of small ruminants in the countries and informally across the boarder represents one of the sources of income that largely determine pastoralists' capacity to purchase food items. Another traded commodity is fish. In its fresh form, it is marketed on the local markets or large quantities that are processed, refrigerated and exported. In its smoked form fish is another commodity on both the local and the trans-boundary markets.

Agricultural imports

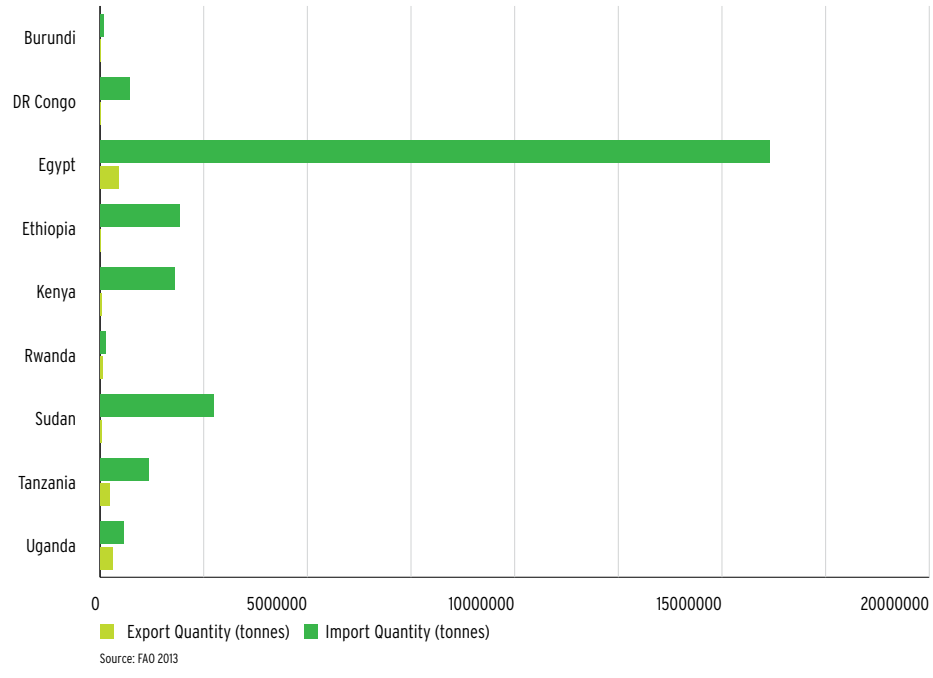
The share of agricultural imports in total imports in the countries is higher than the share of agricultural exports in total exports. This shows an increasing reliance on food imports in the region to fill the deficit that is much influenced by the high population. Much of the imports are food commodities of cereals such as wheat due to the increasing consumer taste for the product and Maize.

Food prices of food commodities

Food prices of food commodities in the Nile basin have remained persistently volatile and have affected countries, households and individuals. The region also faces increasing population, rapid urbanization, changing diets and demand for bio fuel products. These factors increase the demand for food commodities vis-à-vis a challenged food commodity supply due to high prices of fertilizers and fuel, climatic shocks, reduced food stocks, reduced exports and the imposition of food trade restrictions. The restrictions include export bans which increase the uncertainties of food movements between markets in the region, in some cases due to border conflicts. The food price situation therefore poses a significant challenge to the reduction of poverty and hunger.

Generally most countries in the region export industrial crop commodities such as tea and coffee for export earnings and put their import expenditures to importing wheat or food crop commodities in global trade. Intra Nile Basin regional trade is mainly in cereals and pulses, livestock on hooves, and fruits and vegetables

Cereal Trade in the Nile Basin Partner States



Source: FAO 2013

Co-operation between the basin states could be very valuable in the development of the agricultural potential, leading to increased incomes and food security. Greater volumes of trade in agricultural production, combined with the increased use of optimal geographical growing zones for crops (while still securing local basic supplies) could improve efficiency and provide associated increases in economic returns.

CONCLUSION

Photo: istock

Combined with forecast higher living standards and GDP growth, population growth will be the major driver for future food and water requirements in the Nile. Population growth coupled with the current risks, vulnerabilities and challenges posed by poverty, hunger, disease, production and consumption patterns, and climate change, will place increased pressure on the basins natural (forests, wetlands and biodiversity) resources that sustain human life.

The Nile Basin Partner states projected demographic structure, population and urbanization growth present enormous implications and opportunities for human development, structural transformation and sustained economic growth. Demography remains the single most important driver of sustainable development affecting both production and consumption through increased demand for goods and services as well as social amenities, but at the same time poses threats to the sustainable exploitation of the common Nile river basin resources

An estimated 30% of the present Nile basin partner states population currently lives in urban areas. This proportion is expected to grow to 37% by 2030 and 47% by 2050. Cairo, which was the most populous city in the basin by 2010, is expected to grow by 23% to 13.5m people. The challenges of food and water shortages, poor infrastructure and housing remain major concerns as the regions cities burgeon in population, with specific attention needed to reducing the proportion of slum dwellers, who currently account for 70% of urban inhabitants in Africa (UN habitat 2011).

Cross-border agricultural trade in the Nile Basin is hampered by logistic and institutional constraints, and by the low level of agro-processing in most Nile countries. Poor infrastructure in rural areas, absence of infrastructure for bulk cargo transport between the upper and lower riparian zones, very high transport costs, lack of storage facilities, custom procedures and non-tariff barriers, and health regulations and standards that are difficult to meet for individual producers are among the factors that make intra-basin trade of agricultural produce a difficult undertaking.

Trade volumes among the Nile countries are indeed small. Some trade occurs among the East African countries, where Uganda is the largest exporter. Intra-basin agricultural trade between the upper and lower Nile regions is virtually non-existent, apart from export of tea from Kenya to Egypt.

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