

## EXECUTIVE SUMMARY

The Nile Basin Water Resources Atlas has been prepared to support stakeholder dialogues and inform decision-making by the Nile Basin riparian states in order to achieve the shared vision of “sustainable socio-economic development through the equitable utilization and, benefit from, the common Nile Basin water resources”.

The basin is home to more than 257 million people or around 20% of the population of the African continent. The water resources of the Nile Basin are of paramount importance for the socio-economy and sectors such as agriculture, power, navigation, fisheries and water supply, sanitation and health and the environment.

The upper parts of the Nile Basin is characterized by mountain ranges and steep slopes. In the middle reaches there are large plateau regions, while the lower parts have wide flood plains and ultimately the huge Nile Delta. The population's settlement patterns are heavily influenced by the availability of water and the infrastructure. In the downstream countries, population is concentrated along the course of the River Nile and in the Delta. The highest population densities in the upstream countries are found in the Ethiopian Highlands and in the Nile Equatorial Lakes Region. The

rural population of the basin countries increased between 1.5% and 3.0% (2005 – 2015) while the urban population increased between 4.4% and 7.0% in the same period. Poverty is widespread and by income, around 40% of the population of the basin countries live below a poverty line of USD 1.25 per day.

The high dependence on shared basin water resources, which in large areas are scarce, makes a fact-based management essential. Monitoring of water resources is therefore done by all countries and there exist close to 1,000 rainfall stations and close to 450 streamflow gauging stations across the basin countries. Technical and financial resources are needed to operate the stations and get reliable data. In many countries the number of stations decreases and the quality of the data is variable. The need for improvements have been recognized by the Nile Basin Initiative, which has completed a design of a Nile Basin Regional Hydromet System based on upgrading of existing stations adding water quality monitoring and laboratory strengthening. Groundwater monitoring is generally very sparse.

Climatically, the Nile Basin has large variations ranging from the tropical climate in

the equatorial region to the Mediterranean climate of the delta. The variations reflect the latitude range, 4° S to 32° N and the altitude range; from sea level to more than 3,000 m. The equatorial lakes region and southwestern Ethiopia have well distributed rainfall with an average annual rainfall of more than 1000 mm while Sudan and Egypt have negligible rainfall, with an average annual rainfall below 50 mm. Combined with temperature ranges of 10 – 45°C, very little surface runoff is generated here. Global warming is bringing about changes in climate around the world. Trends and statistics have to be reviewed as even small changes in temperature averages or extremes can have serious consequences for water resources and supplies, agriculture, power and transportation systems, the natural environment, and even health and safety.

The Nile Basin streamflow patterns are influenced by the variations in climate and topography/altitude. The Blue Nile is highly seasonal with most of its flow occurring between July and September, while the White Nile flow is stable over the year. On the average, the Blue Nile contributes almost twice the volume of water (roughly 1600 m<sup>3</sup>/s) of the White Nile. Groundwater is another, though small part of the water

resources of the basin. The most significant aquifer is the Nubian Sandstone. Sediment production takes place in upland areas with the Ethiopian Highlands as the main source compared to other parts of the basin. Water quality is generally influenced by human activities and urban areas and industrial activities are the main influencing factors.

The water resources in the basin are essential for sustaining life, the economy and a healthy environment. Water is used off-stream (withdrawn e.g. for agriculture or domestic use), in-stream (e.g. hydropower, fisheries, environment) or on-stream (e.g. transport, tourism). By far, the largest consumptive use is for irrigation (roughly 2600 m<sup>3</sup>/s) with Egypt and Sudan as the largest users. Water demand for municipal and industrial use is rapidly increasing from the present estimates of roughly 400 m<sup>3</sup>/s. Water demands for all sectors is expected to increase substantially and there is a risk that the aggregate water demand basin-wide can surpass available water will become unable to meet the water demand. A high degree of trust, collaboration and sharing of water and benefits between the Nile riparian nations becomes imperative and the Nile Basin Initiative has a strategic mission to facilitate the cooperation.

