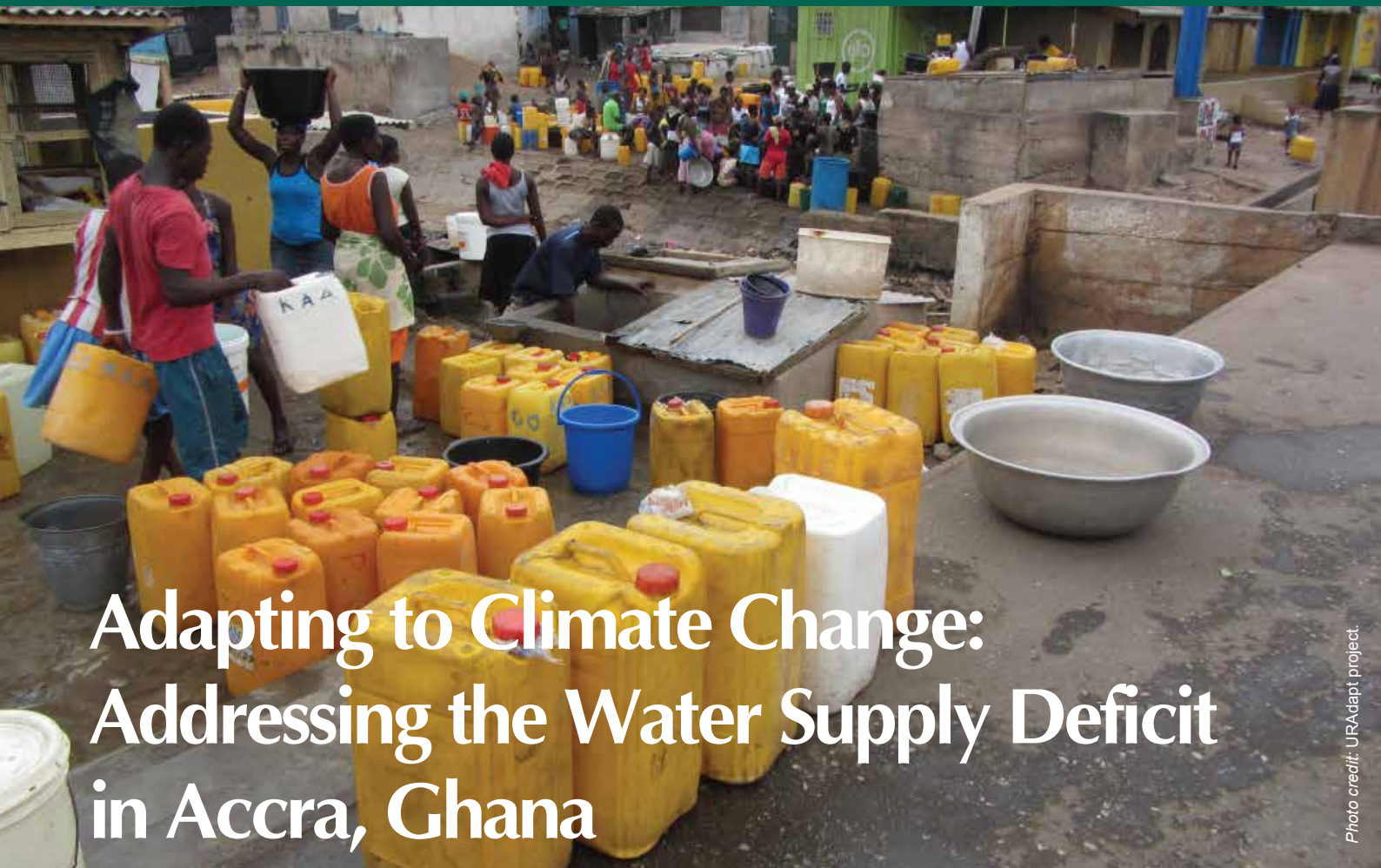


# issue brief



## Adapting to Climate Change: Addressing the Water Supply Deficit in Accra, Ghana

Photo credit: URAdapt project.

*City managers need an integrated approach to address the city's water supply-demand deficit.*

- Piped water originates from two main surface water sources, providing over 98% of the city's water supply in nearly equal proportions.
- With the onset of climate change, by 2050, inflows to the Weija Lake could reduce by about 10%. Even at current abstraction rates from the reservoir, the vulnerability index of the Densu Basin would increase to 38%. The envisaged drying weather conditions could result in more abstractions, especially for irrigated agriculture in the upper catchment, leading to further reduction in water availability.
- Population growth in the Greater Accra Metropolitan Area (GAMA) over the last century coupled with inadequate public infrastructure for treatment, storage and distribution, has resulted in a water supply-demand deficit. The Ghana Urban Water Limited (GUWL) distributes water on a rotational basis, resulting in intermittent supply, sometimes only for a few hours a week.
- The popular response has been individual household storage, thus providing some buffer capacity. The total storage amounts to one days' production from the Weija treatment works.

# issue brief

## METHODOLOGY

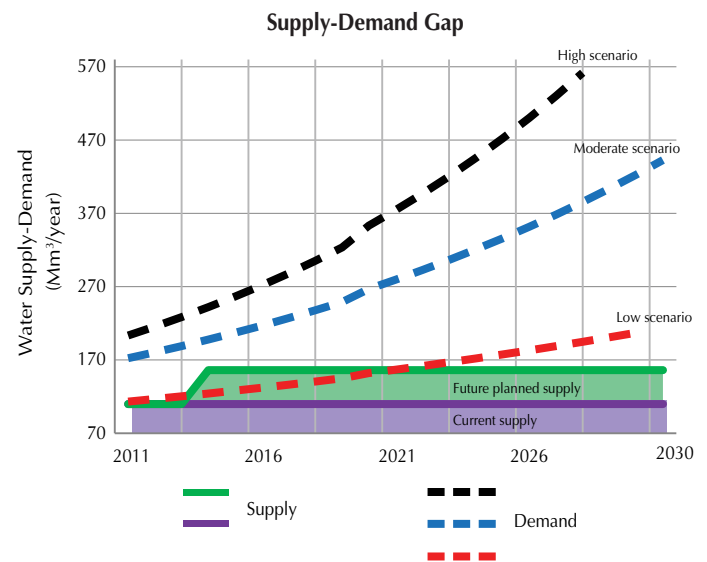
- The impacts of climate change on surface water resources of the Densu River Basin were determined with hydrological modelling using downscaled climate data from a Regional Climate Model (RegCM4).
- Population growth rates for the period 2010-2030 were forecast using three population growth projections of 3.1% (low), 4.6% (moderate) and 5.8% (high).
- Water demand values of 80, 120 and 140 liters per capita per day were adopted as indicative demand scenarios, based on consultation with the service provider.
- Three scenarios were tested, combining different population growth rates and per capita water demand.
- The URAdapt Research into Strategic Action Platform (Re-SAP), comprising diverse water stakeholders, validated the data and findings.

## FINDINGS

- Current annual abstraction for water supply is 33% of the Densu River's annual streamflow with other uses upstream accounting for 1%. The basin is already subject to water-stressed conditions.
- Current and planned abstraction for water supply from the Kpong Reservoir in the Lower Volta Basin is only 1% of the basin's streamflow. Despite climate change, there is more than sufficient water to cater for all of Accra's future requirements of potable water.
- There is an existing supply-demand gap of about  $63 \times 10^6 \text{ m}^3 \text{ yr}^{-1}$  despite current plans for increasing water supply. Future water demand scenarios have not been accommodated.
- A shift in any of the non-climatic factors, such as population growth and water demand, will increase the supply-demand gap.

## MANAGING THE SUPPLY-DEMAND DEFICIT

- Target the Lower Volta Basin for future abstractions.
- Apply a holistic basin water resources management approach, involving all stakeholders.
- Explore and apply appropriate policy instruments to improve water-use efficiency and encourage water saving in cities.
- Reduce high physical and commercial losses in the system.
- Encourage rainwater harvesting (RWH) for both potable and non-potable use.



Water supply-demand situation for GAMA  
(Source: URAdapt project).

## For more information

For more information on this and related projects, contact Edmund Kyei Akoto-Danso at [e.akoto@cgiar.org](mailto:e.akoto@cgiar.org) or Barnabas Amisigo at [barnyy2002@yahoo.co.uk](mailto:barnyy2002@yahoo.co.uk)

URAdapt was a three-year project which aimed to reduce the vulnerabilities of Accra, Ghana, and Addis Ababa, Ethiopia, to climate change through improved and integrated urban water management. The project placed the city within its broader basin context, thereby focusing the research on urban-rural connectivity. URAdapt brought together climate change and water management experts, decision-makers and representatives of vulnerable communities to collectively design adaptation strategies for the water-use sectors in Accra and Addis Ababa. This project, which was implemented under the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), was facilitated by the International Water Management Institute (IWMI), the Council for Scientific and Industrial Research (CSIR), Ghana, and the Addis Ababa University, Ethiopia.

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