Water demand and urbanisation: The internal water footprint of the Thiririka River sub-catchment, Gatundu South, Kenya

Julian Behnen, Brigitta Schütt & Stefan Thiemann

Freie Universität Berlin, Department of Earth Sciences, Physical Geography, Malteserstraße 74-100, 12249 Berlin, Germany

Main Objectives

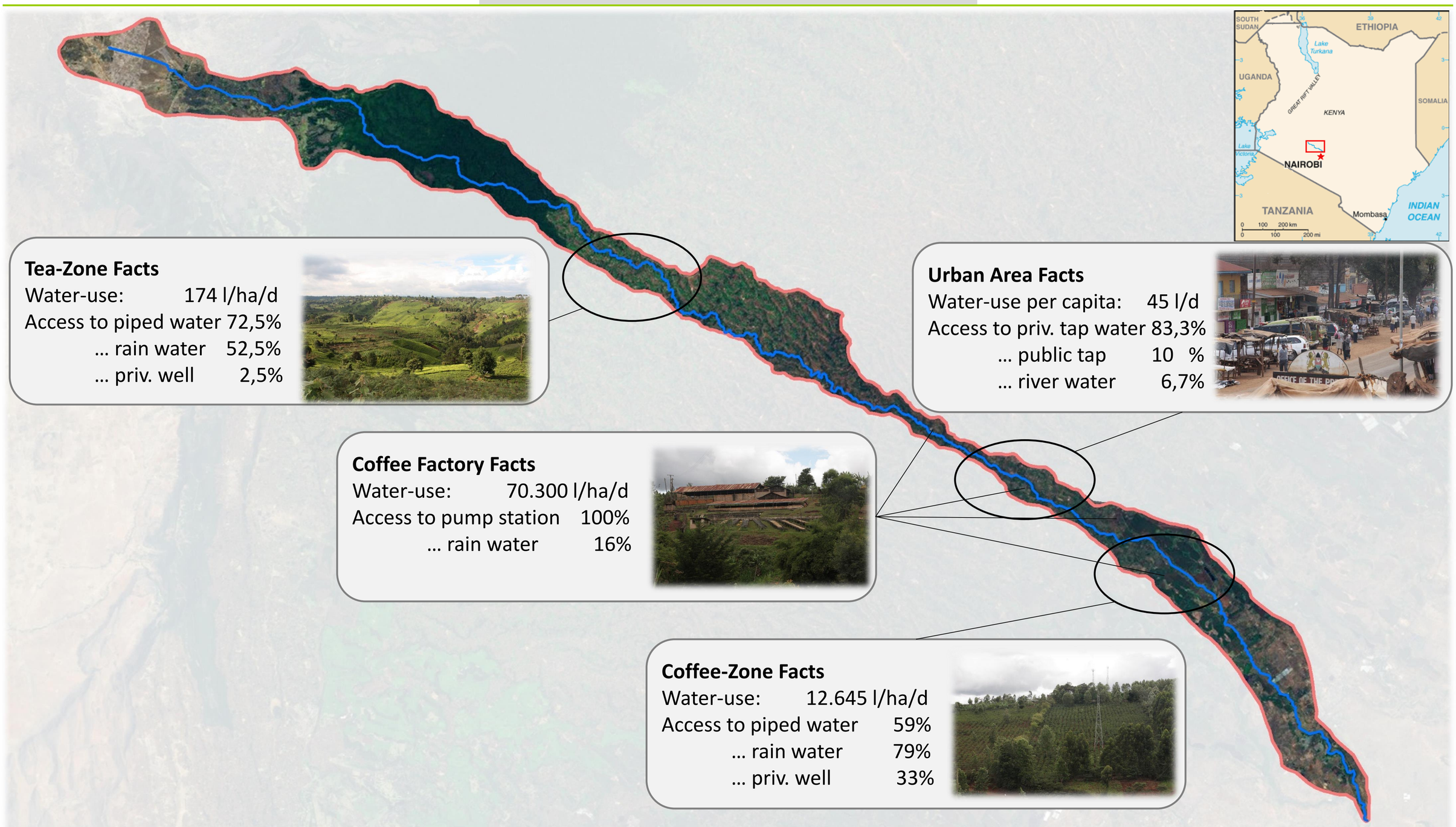
The study aims to calculate a comprehensive water footprint for the whole of Thiririka River sub-catchment. To archive this the water demand of common types of land-use in the area has to be determined. Combining data from quantitative interviewing with land-use mapping will allow the calculation of the internal water footprint. Thus, enabling insight into current and future watershed management concerns.

Nairobi's Population Pressure

Being situated only 40 km to the North of Nairobi (4500 inhabitants/km²), the study area incorporates the urban area of Gatundu South (590 inhabitants/km²). Rapid population growth accompanied by an increasing utilisation impact on natural resources are of mayor concern. Prudent zoning and land development planning are crucial and require profound information for decision makers and stakeholders alike.

Practical Utility

Water and the access to it are oftentimes the limiting factor for human development, food security, hygiene and disease control. Coherent information about a population's water demand related to the watershed's limit values allow for sustainable planning. Forecasting the impact development goals will have, enables administrators to weight decisions in favour of economic growth, ecology and supply security.



Tea-Zone Facts

Water-use:	174 l/ha/d
Access to piped water	72,5%
… rain water	52,5%
… priv. well	2,5%

Urban Area Facts

Water-use per capita:	45 l/d
Access to priv. tap water	83,3%
… public tap	10 %
… river water	6,7%

Coffee Factory Facts

Water-use:	70.300 l/ha/d
Access to pump station	100%
… rain water	16%

Coffee-Zone Facts

Water-use:	12.645 l/ha/d
Access to piped water	59%
… rain water	79%
… priv. well	33%

First Results

In the study area farming is mostly done by small-scale and subsistence farmers, planting mixed crops for own use and adding cash crops if possible. These farm's water demand averages at 170 l/day for cattle and household combined. Irrigation is not being practiced. Bulk consumers like greenhouses, coffee factories and large farms use approx. 630.000 l/day, mostly for irrigation. While the former mainly use rainwater (only 58% are connected to piped water), the latter rely on extracting water from the river using pump-houses.

Of further concern is the lack of waste water treatment facilities and the amount of 10.6 t/ha/a of fertiliser used between all farms surveyed. Fresh water is needed to dilute pollutants, thus again exalting the overall water-use in the area.

Finite resources and a lack of infrastructure are limiting factors to a sustainable economic growth of the region. Hence, learning to better manage them while conserving the catchment's natural water supply system, will support the local economy and a better livelihood.

Contact:
Anette Stumptner
Freie Universität Berlin
Department of Earth Sciences, Physical Geography
Malteserstr. 74-100, 12249 Berlin
Email: anette.stumptner@fu-berlin.de
Tel.: +49-(0)30-838 70453