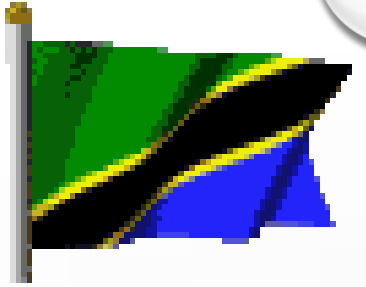
MINISTRY OF WATER AND IRRIGATION



Water, Development and the Future of Water Engineering in Tanzania

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Content

- About Tanzania
  - The beauty
  - The development agenda and the place of water
- The role of water in socio-economic development
- The state of water resources in Tanzania
- The status of water use and supply
- The future of water engineering

Tanzania

- 945,203 square kilometres
- half of all land available in East Africa
- 30% of the land is a protected area, one of the largest in the world

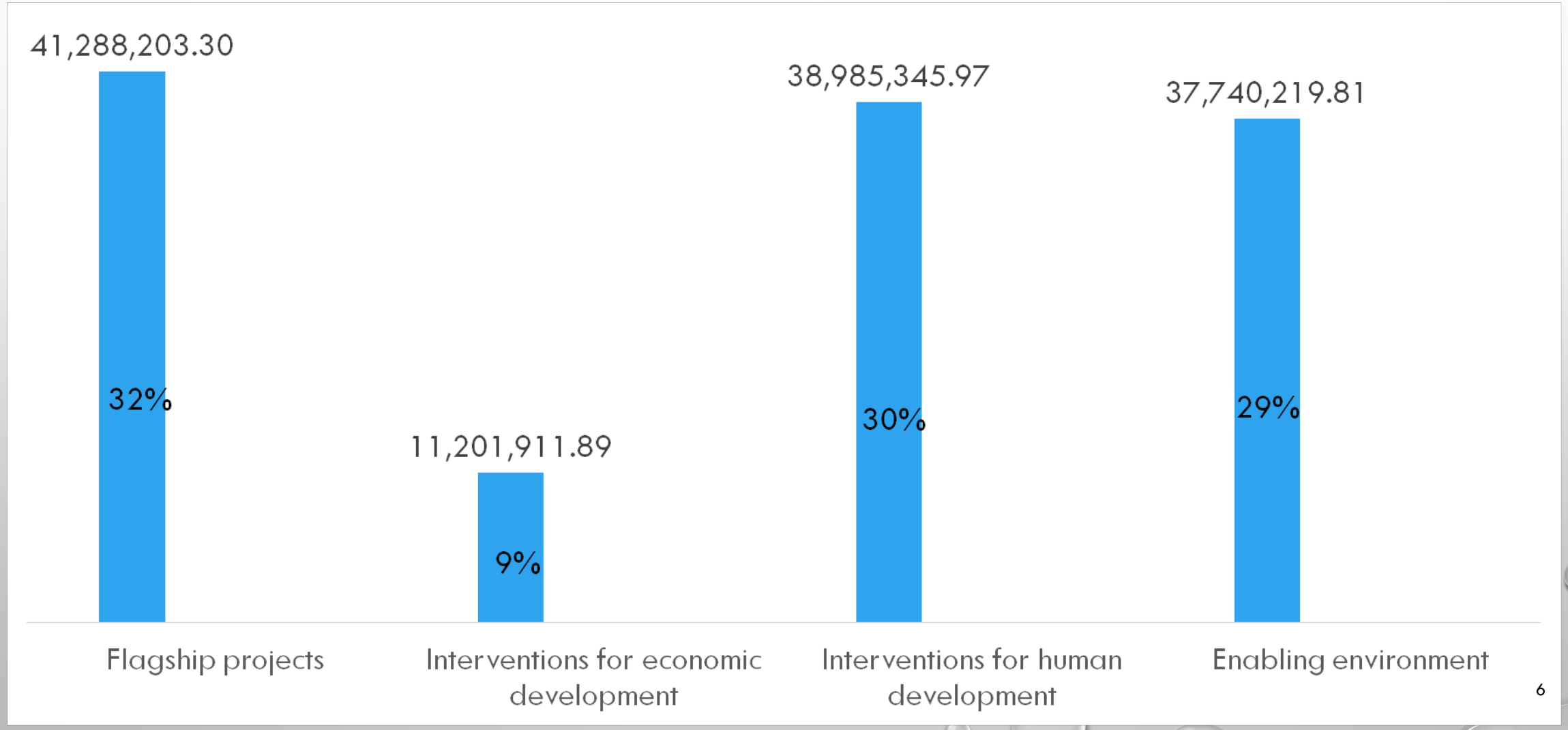
Great Ecotourism Potential

- 7 UNESCO Heritage Sites
- **The Ngorongoro Conservation Area**, the world's largest and most stunning caldera, teeming with game. Ngoro Ngoro is a thing of beauty, a joy forever.
- **The Serengeti**, where we find the richest concentration of wild game, and the most spectacular seasonal game migration on earth.
- **Selous Game Reserve**, Africa's largest game reserve (and one of the world's largest protected areas), designated as a UNESCO world heritage site since 1982.
- **Zanzibar**, the most famous spice-paradise island in the world, with a rich history of the colonial past

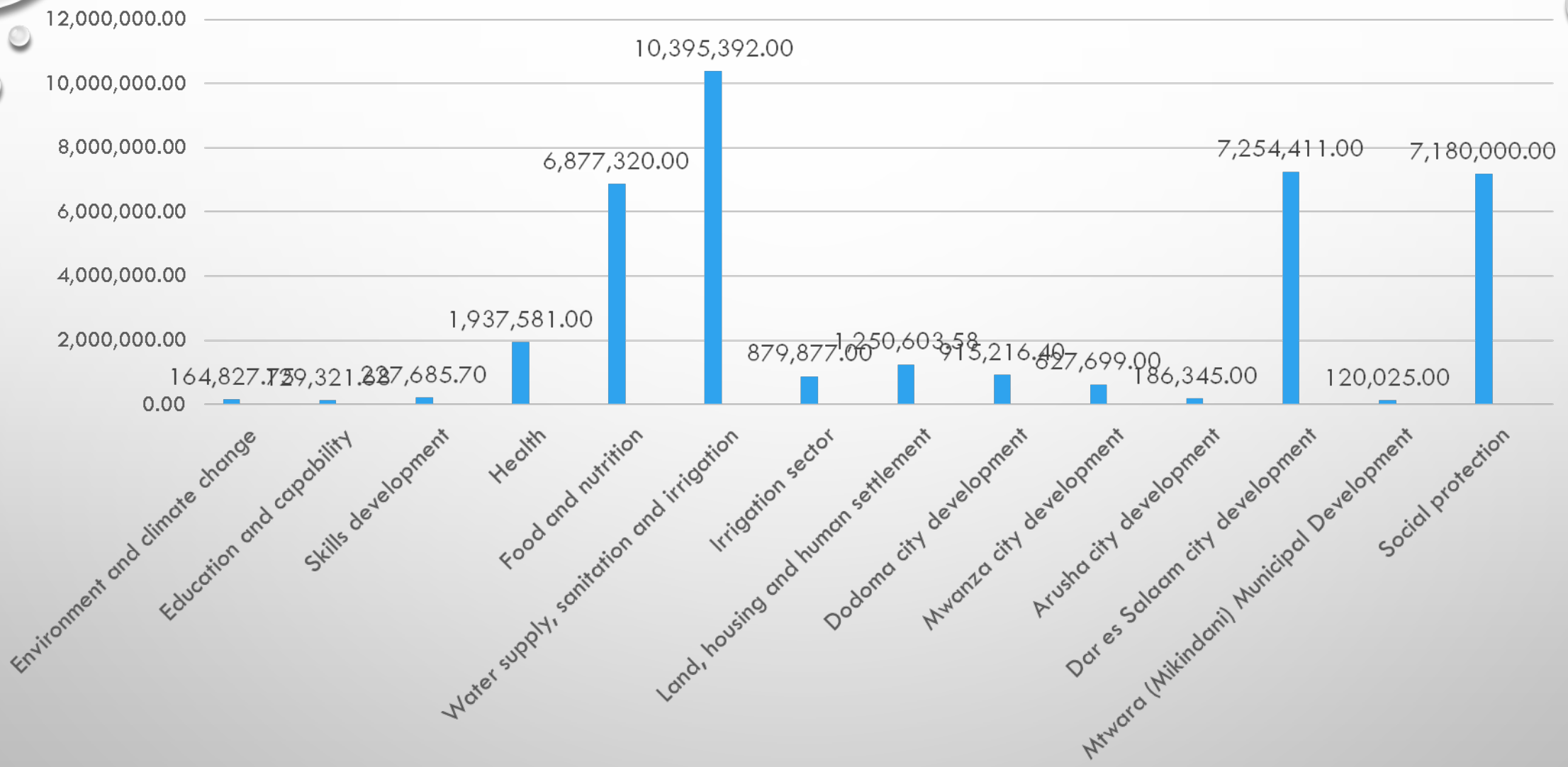
Tanzania Development Agenda

- Tanzania's development agenda is guided by the Tanzania development vision 2025
  - Focus: to transform Tanzania into a middle-income country
- Implementation arm: Long Term Perspective Plan (LTPP) 2011/2012-2025/2026 implemented through five year development plans: 2016/2017-2021/2025
- Currently on second phase: 2016/2017 – 2021/2025
  - Nurturing an industrial economy in a bid to transform Tanzania into a semi-industrialised nation by 2025

FYDP II Components and their Cost of Implementation (in Millions)



Sub-components of Interventions for Human Development and Their Cost of Implementation 2016/2017-2020/2021

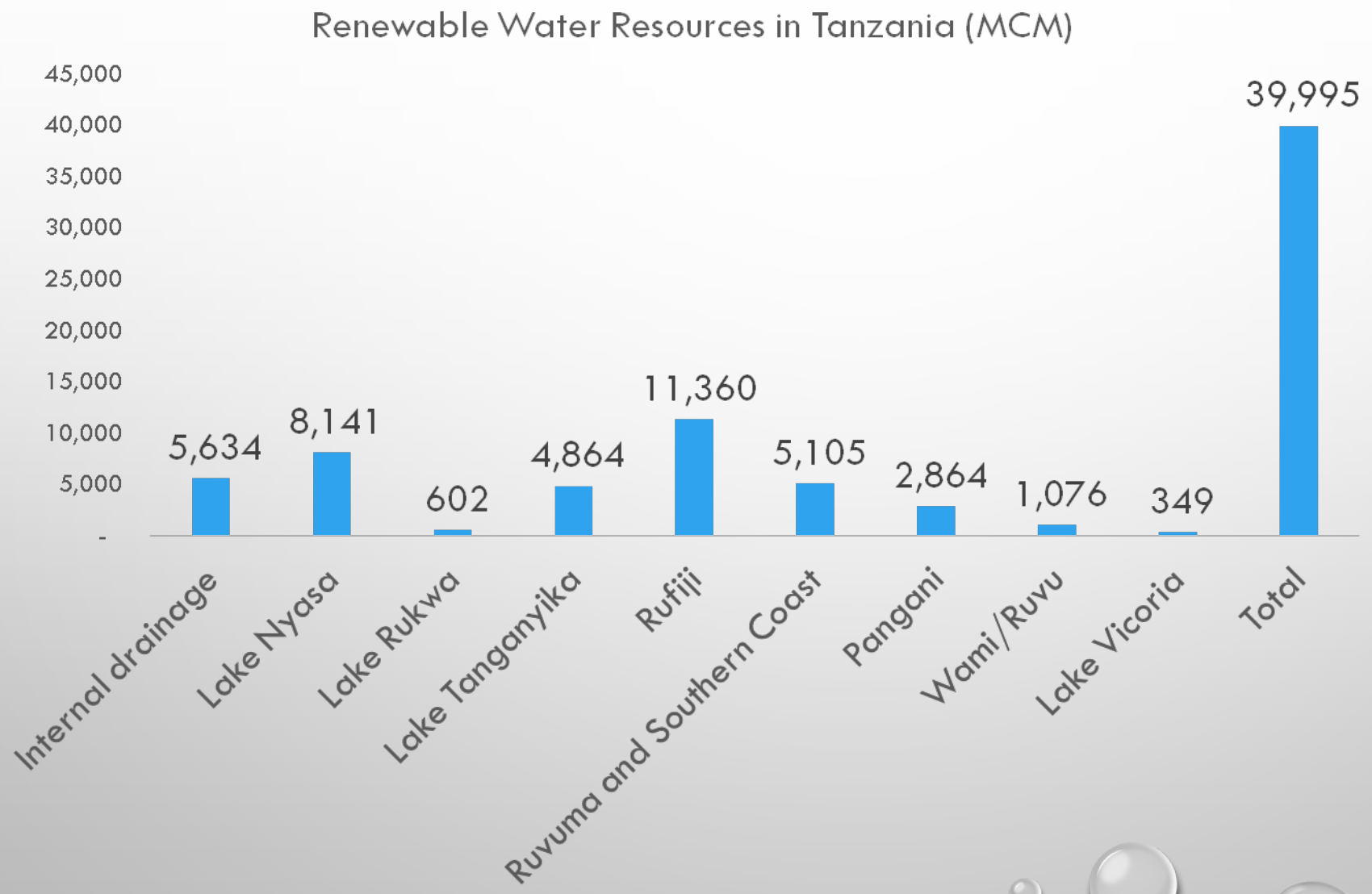


The Role of Water in Socio-economic Development

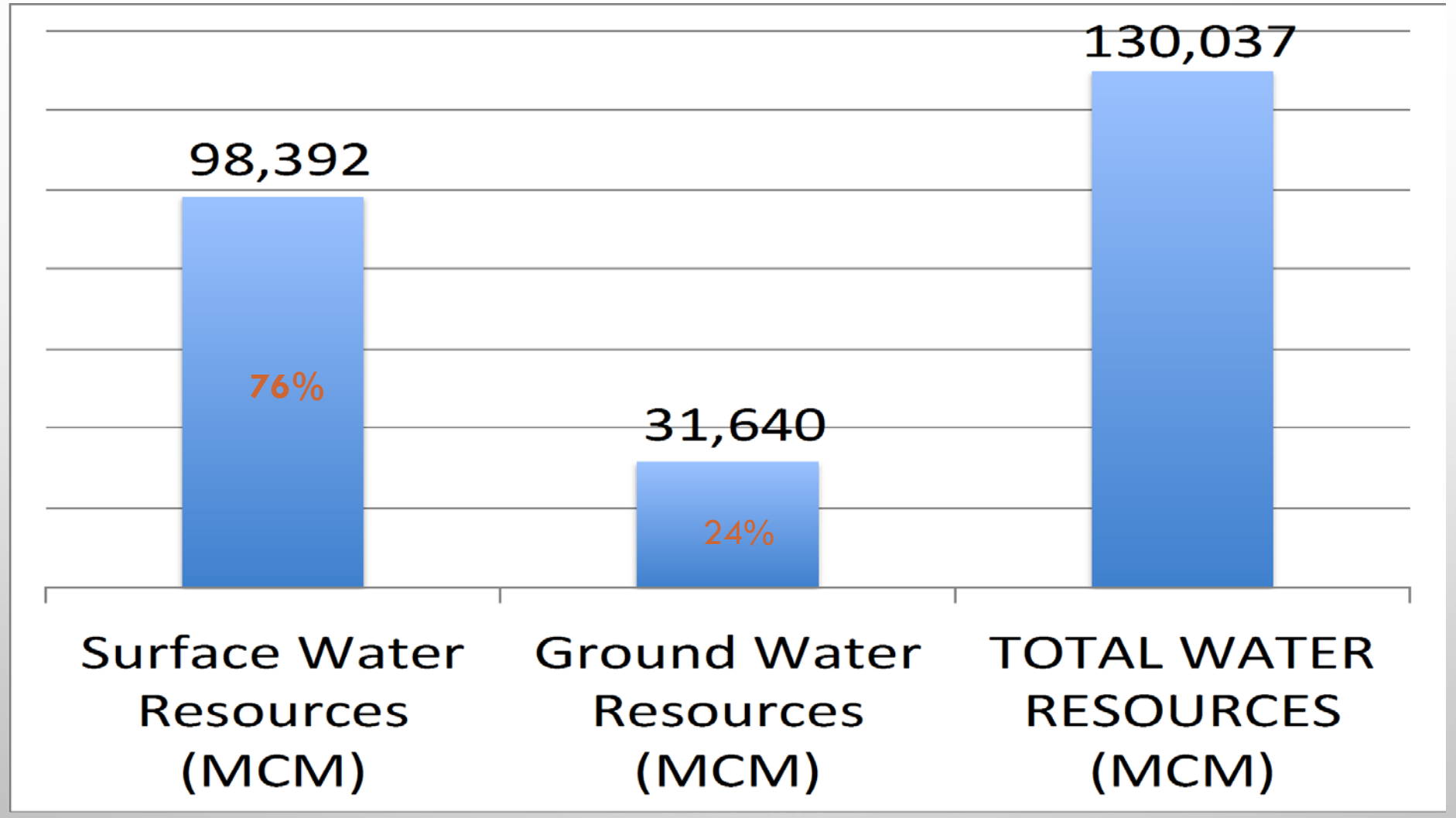
- Water is at the heart of all aspects of sustainable socio-economic development
  - for human survival
  - Wherever water is available, economic opportunities are enhanced, environments are protected, and human civilisation sets in.
  - Some historians have argued that the emergence of civilisation was associated with organised efforts to control water for various uses, including irrigation

The state of water resources

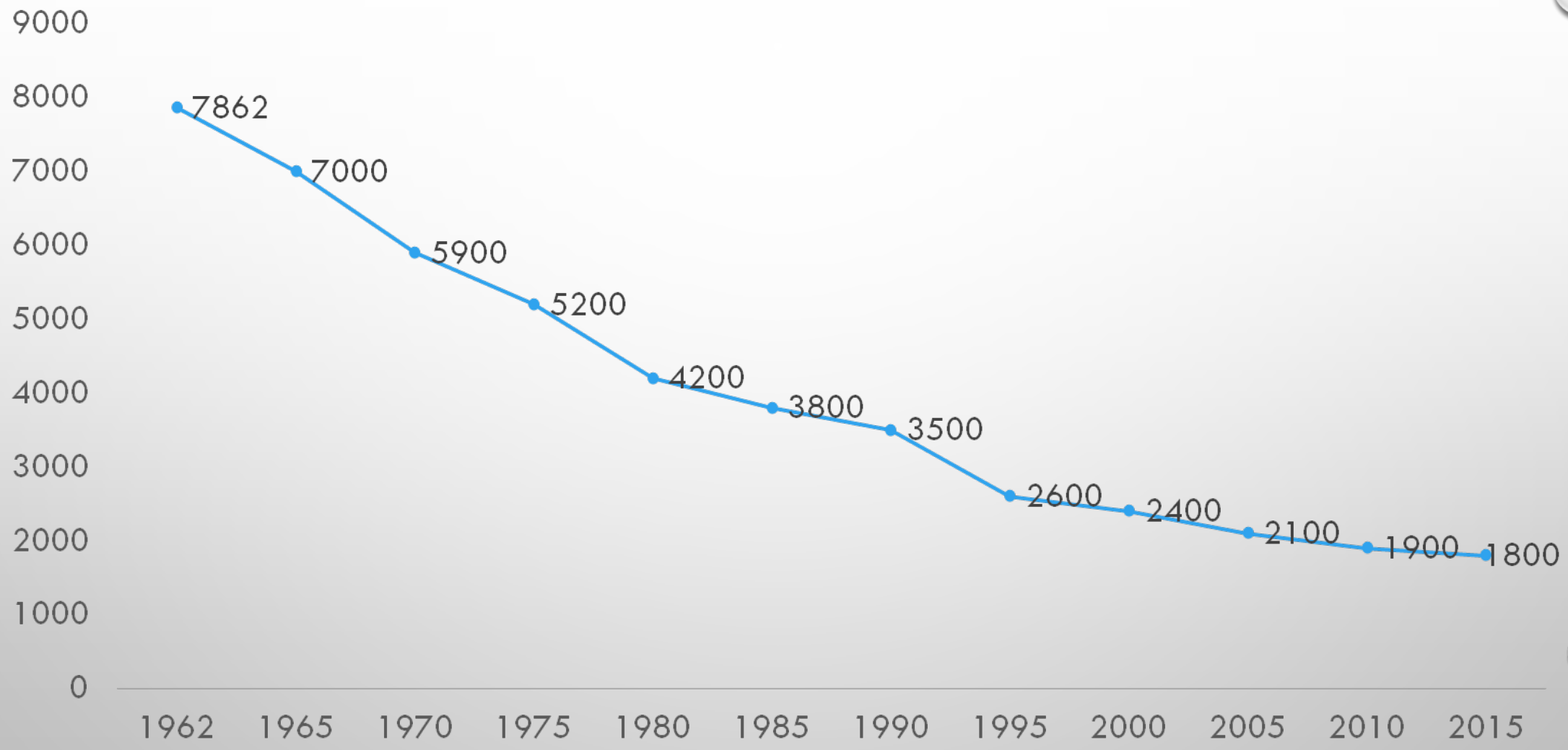
- Tanzania has relatively 'abundant' water resources, compared to other countries in the south African region, but these resources are depleting rapidly
- FAO estimates that, in 2015, Tanzania had 96.27 billion cubic meters (BCM) of renewable water resources per year
  - This corresponds to 1,919 cubic meters per person a year
- This water is unevenly distributed in different basins


Renewable Water Resources in Tanzania (MCM)
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
-
5,634
8,141
602
4,864
11,360
5,105
2,864
1,076
349
39,995
Internal drainage
Lake Nyasa
Lake Rukwa
Lake Tanganyika
Rufiji
Ruvuma and Southern Coast
Pangani
Wami/Ruvu
Lake Vicoria
Total

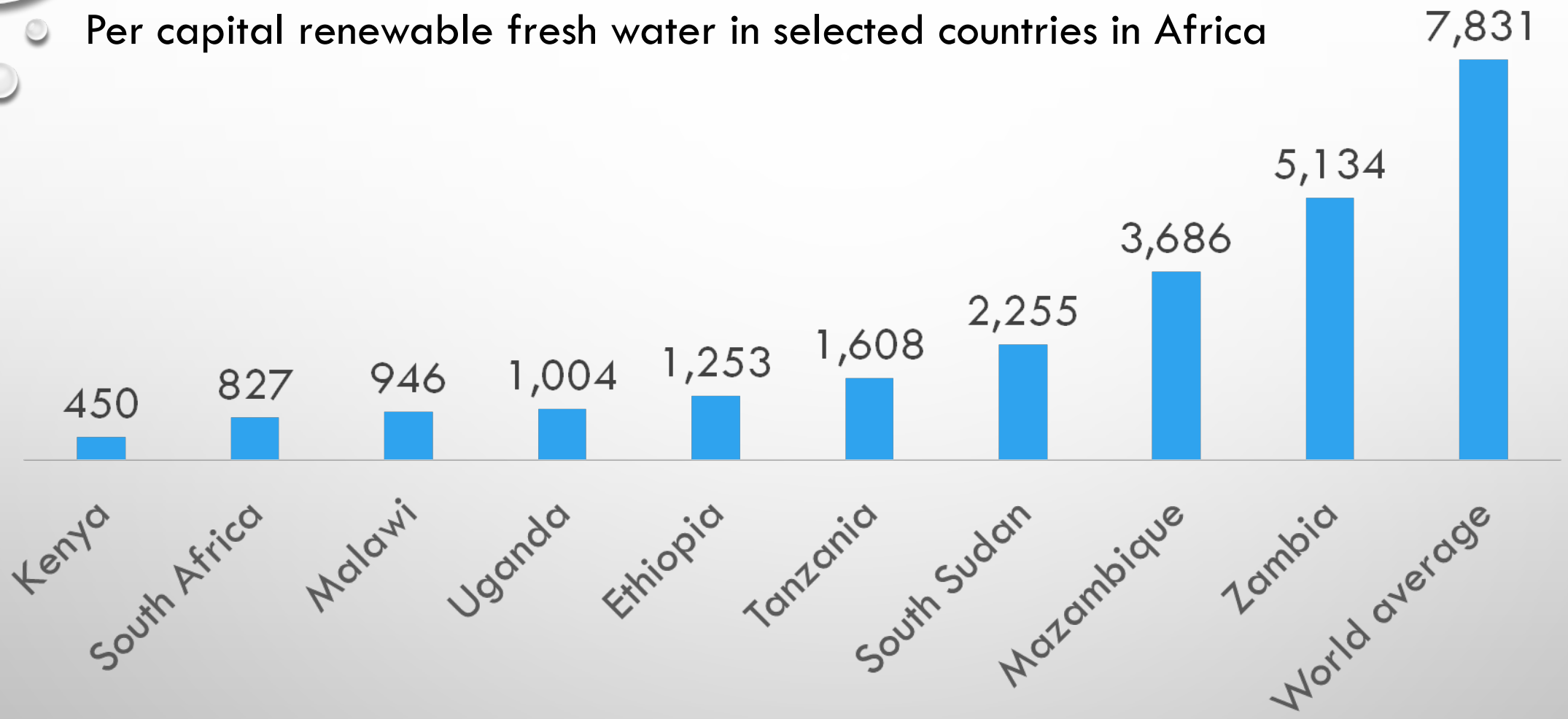
Renewable surface and ground water resources in Tanzania



Trends in per capital water resources (in cubic meters) in Tanzania: 1962-2015



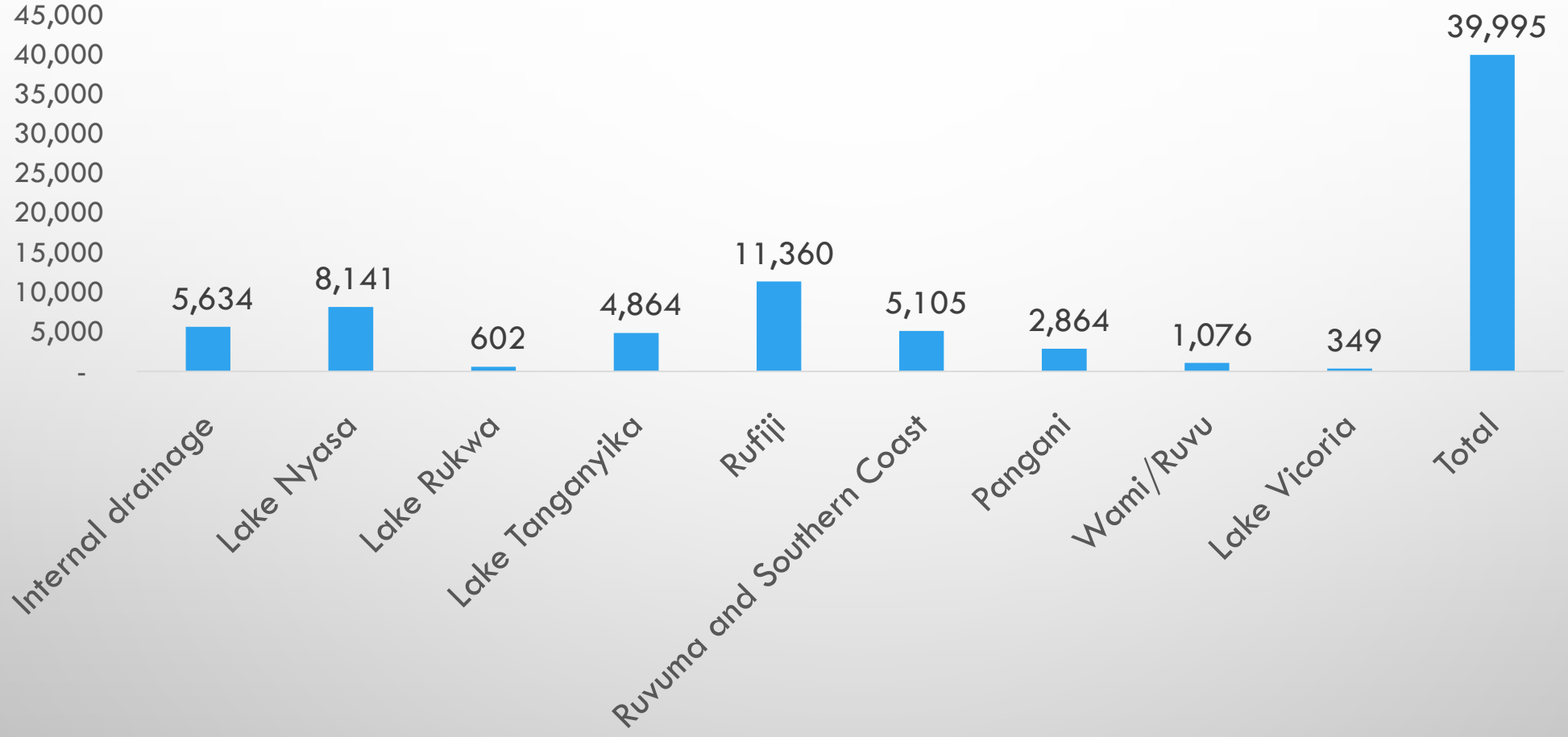
- Per capital renewable fresh water in selected countries in Africa



The State of Water Use and Supply

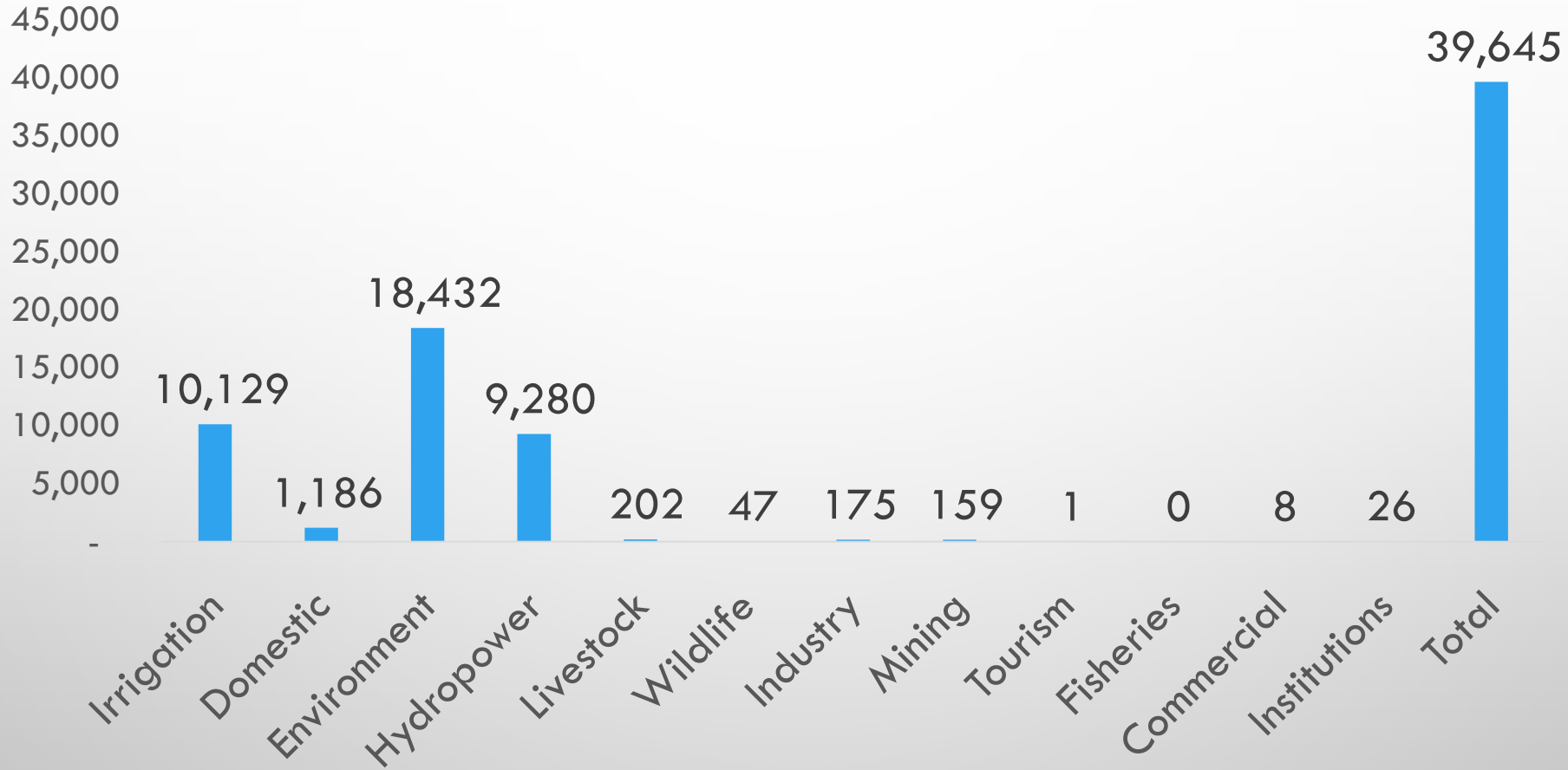
- Water use and supply in Tanzania is guided by the ***Water Sector Development Programme (WSDP II)*** now in its second phase
  - WSDP aims to enhance water resources management for socio-economic development and sustainable environment, and ensure that all social groups in rural, peri-urban and urban areas have access to adequate, clean and safe water and sustainable services
  - ***Rufiji, Lake Nyasa*** and ***Internal Drainage*** are the three basins with the largest water use in Tanzania

Water Demand by Basin (MCM) in 2015



- Irrigation. hydropower and domestic sectors are the first three biggest water users in Tanzania
- Rufiji and Pangani basins have the most water abstraction for irrigation
- Wami/Ruvu has the most water abstraction for domestic use

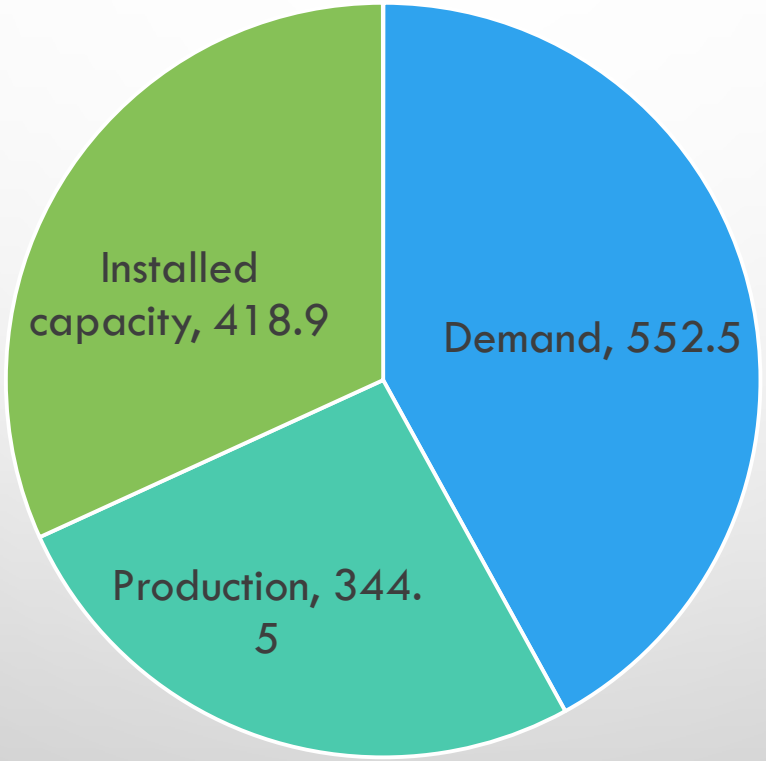
Water Demand by Sector (MCM) in 2015



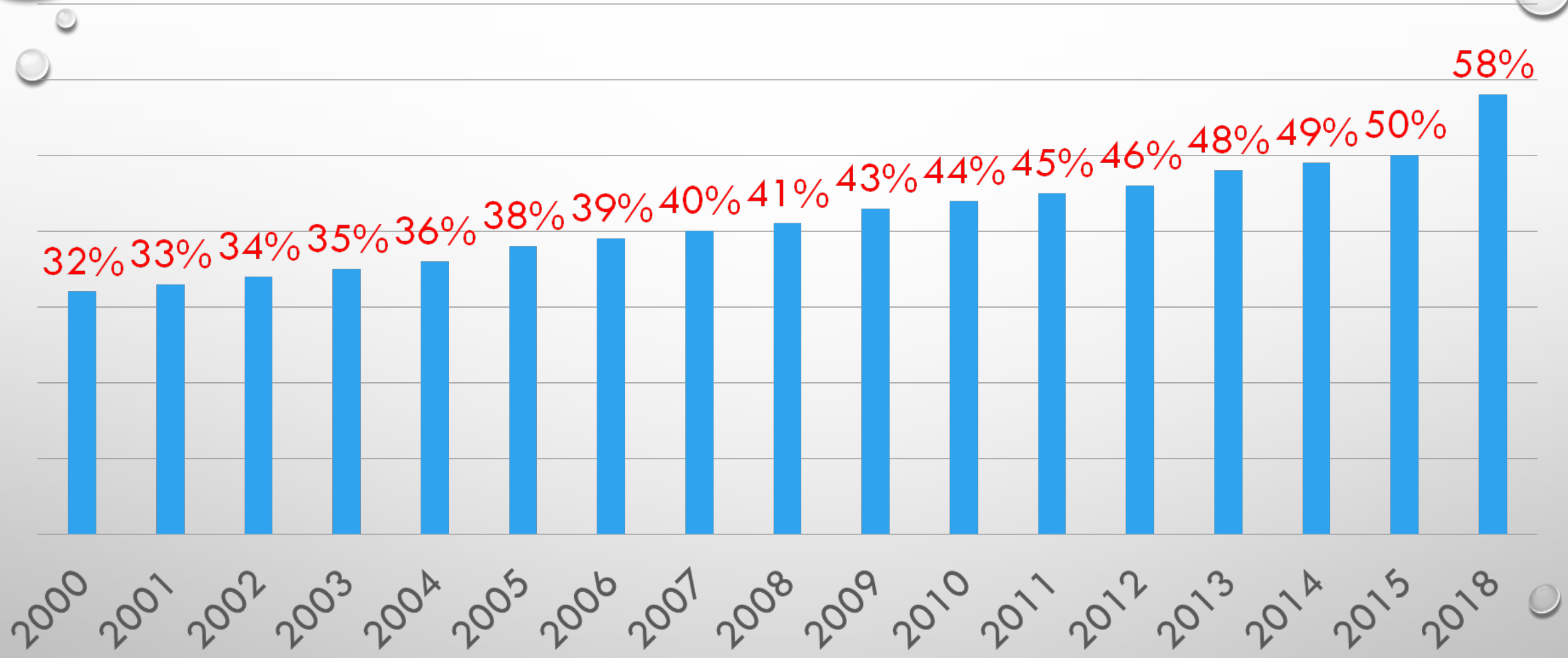
Access to Drinking Water

- Water for human needs is of high priority in Tanzania (NAWAPO 2002)
- Currently, the demand for drinking water surpasses the production capacity by almost a third (37.6%)
- Consequently:
  - Only 58% of rural population and 78% of urban population have access to improved sources of drinking water
- Trend analysis of access to drinking water data shows a slight increase over the years (but the increase is relatively slow compared to targets)

Drinking water demand as compared to production and installed capacity in Tanzania 2016/2017 in MCM a year



Trends in drinking water coverage in Tanzania: 2000-2018



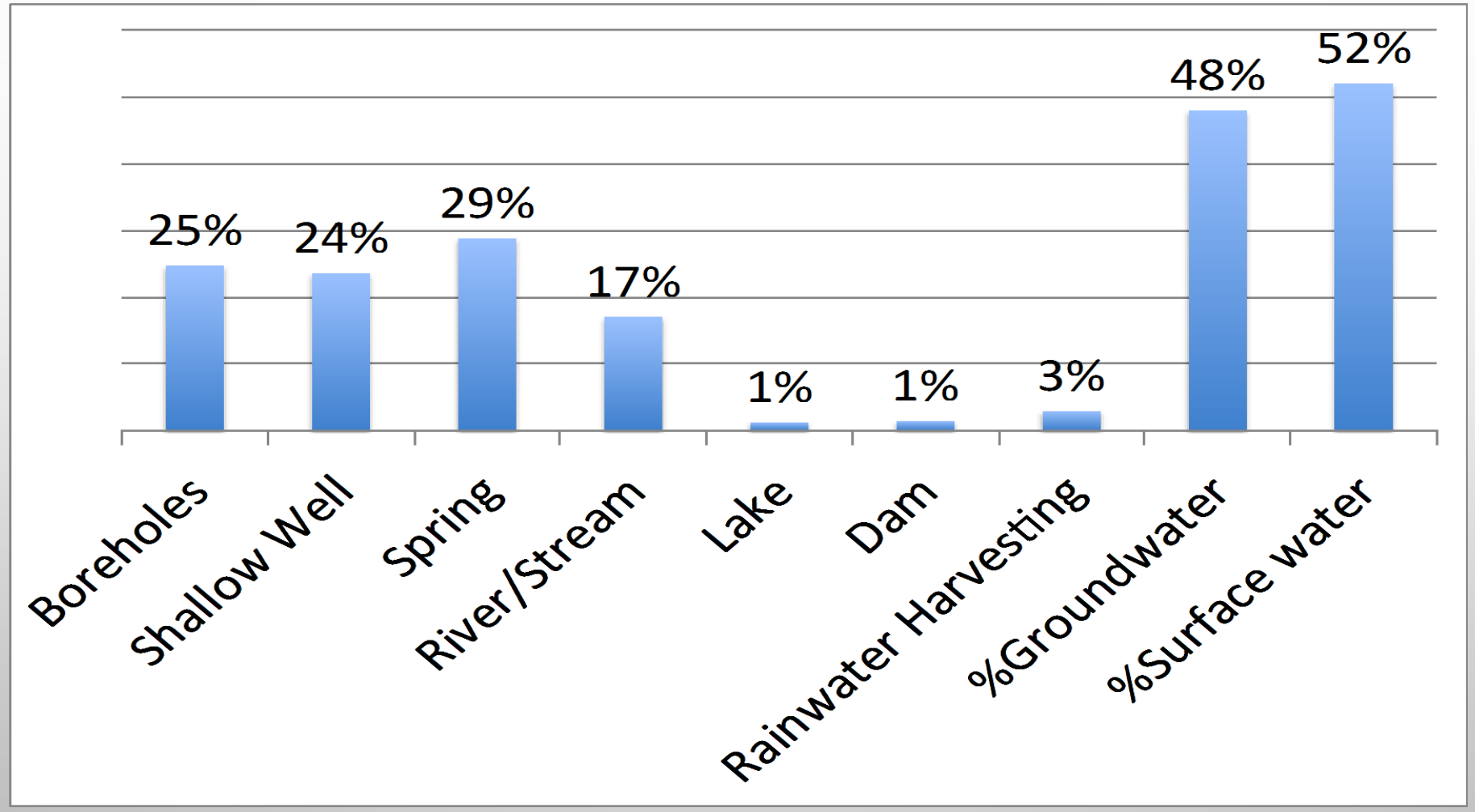
Source: WHO & UNICEF (2017). *Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines (except 2018)*

Six Issues Needing Reflection and with Implication on the Future of Water Engineering in Tanzania

1. Under Exploitation of Surface Water Resources and Over-reliance and Dependence on Ground Water Resources

- Though surface water resources are bigger in volume than ground water resources, we rely more on ground water resources than surface water resources, with hitherto little results in terms of improving access to drinking water.
  - ***How can the water engineering support the exploitation of the large surface water bodies (Lake Victoria and Lake Tanganyika) to reduce and ultimately end water poverty in Tanzania?***

Number of Water Points per Source of Water



2. Poor design problems

- Recent study revealed massive problems of design in a number of water projects, especially in many rural water projects
    - ***How can water engineers improve their project design to improve the efficacy of water projects and for them to win confidence of employers?***

3. Underrepresentation of local contractors and consultants

- More than 52 large ongoing water projects in the country worthy of TZS 1.9 trillion
- Only 17% of contractors and consultants are local and mostly in relatively small projects (less than TZS 10 billion)
  - ***How can we facilitate local consultants and contractors to take part in large water projects and create wealth and employment to Tanzanians?***

4. Underrepresentation of local contractors

- Professionalisation of community water service delivery and project management
  - ***How can we professionalise rural water service delivery and project management?***

5. Water governance

- Water resources management framework and water supply governance
  - ***How can water governance system be designed in a way that is responsive to the needs of the poor and costly realistic and effective?***

6. The cost of drinking water for rural residents

- Rural residents pay higher tariffs than their urban counterparts
  - ***How can water engineering make rural water supply as cheaper/affordable as in urban areas?***