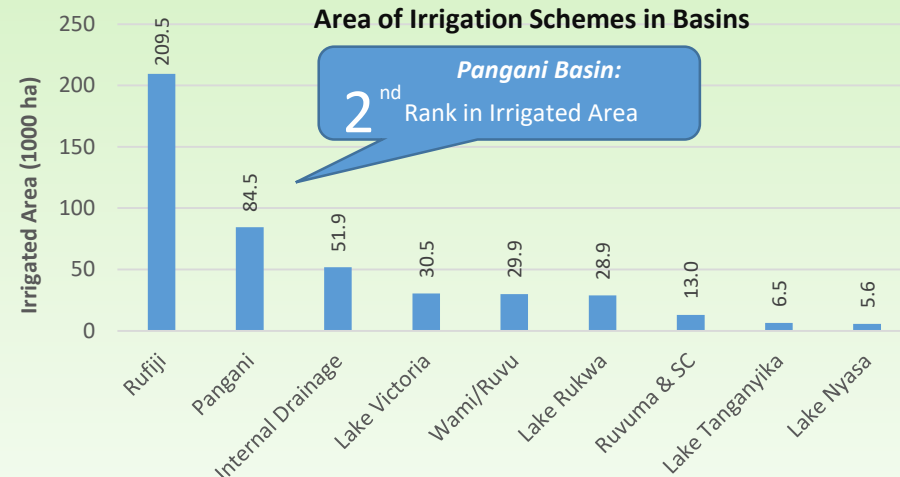
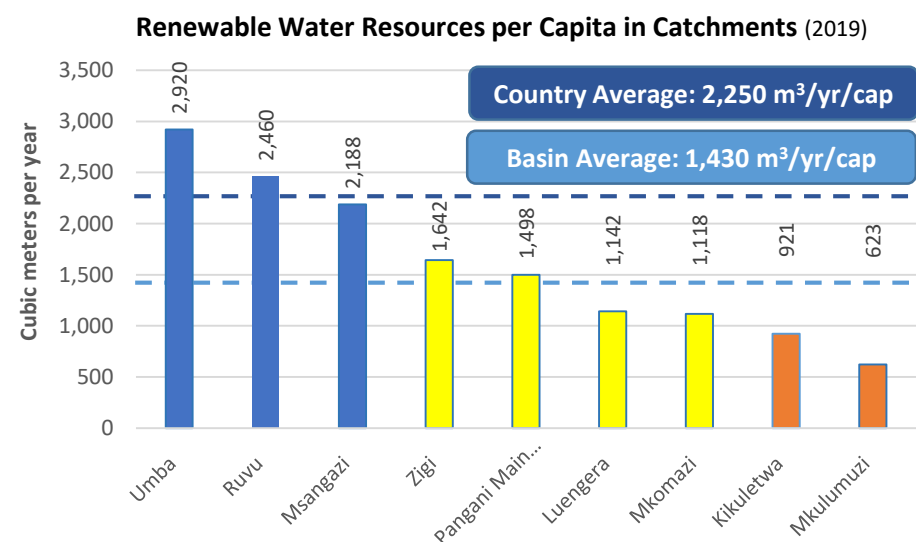
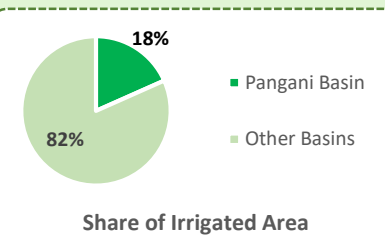


## Pangani Basin Water Demands Key Figures



Tanzania's Total Irrigated Area:  
460,000 ha

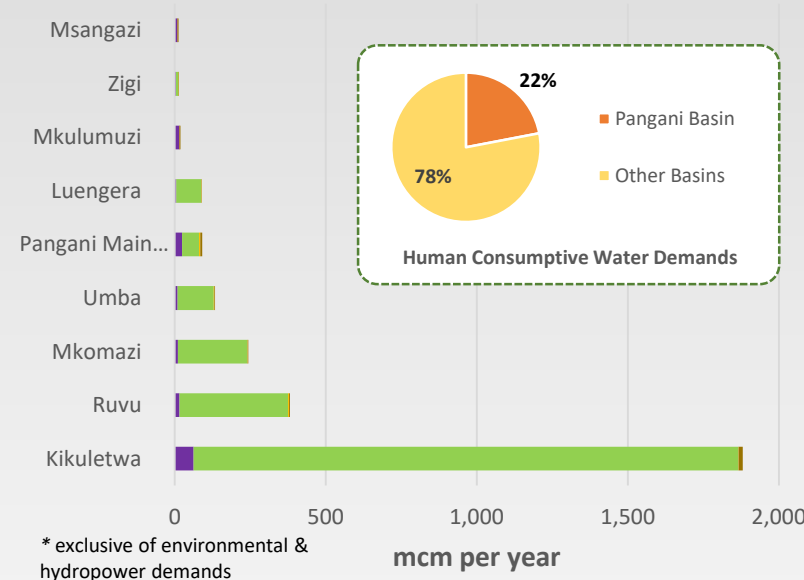


### The Falkenmark Water Stress Indicator

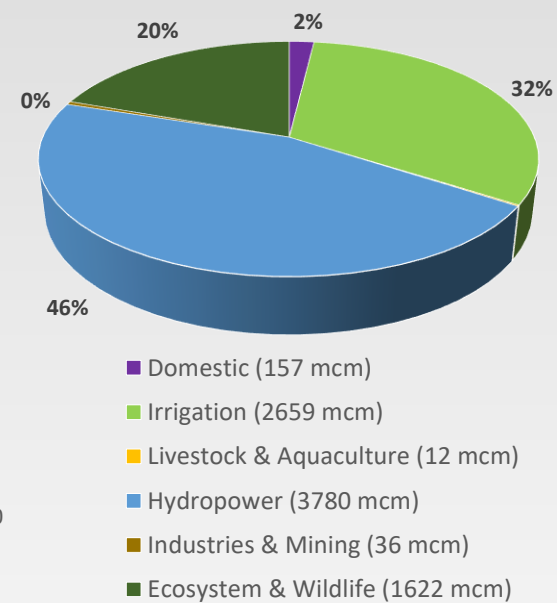
Available Renewable Water per Capita (m³/yr)	Indication
< 1700	Water Stress
< 1000	Water Scarcity
< 500	Absolute Water Scarcity

**75% of population in Pangani Basin are experiencing water stress.**

### Water Demands in Catchments\* (human consumptive demands)



### Water Demands by Sector (%) Pangani Basin



Irrigated farming is the largest water user in Pangani Basin. About 33% of the renewable water resources in the basin is required for supplying irrigation water demands, and less than 3% is currently utilised for domestic, industries, and livestock sectors. Irrigation sector accounts for about 93% of human-consumptive uses, while hydropower sector which is regarded as non-consumptive water utilisation, captures latent energy in 51% of surface water resources in Pangani Basin.



### Physiographic Profile

Basin Area	54,600 km²
No. of Sub-basins	5
Catchments	9
Protected Areas	40
No. Area	17295 Km²
Dominant Soil Texture	Sand
Dominant Productive Formation	Mafic-Felsic Granulite Complex
Mean Vegetation Index	0.31
Forest Cover Change (2000-2015)	-0.87 %/yr
Average Slope	6.8 %
Altimetry	
Highest	5,855 m.a.s.l.*
Lowest	0 m.a.s.l
Mean Elevation	833 m.a.s.l

\* m.a.s.l: meters above mean sea level

### Socio-Economic Profile (2019)

Population	5.57 million
Population Density	102 person/km²
Water per Capita	1,430 m³/yr

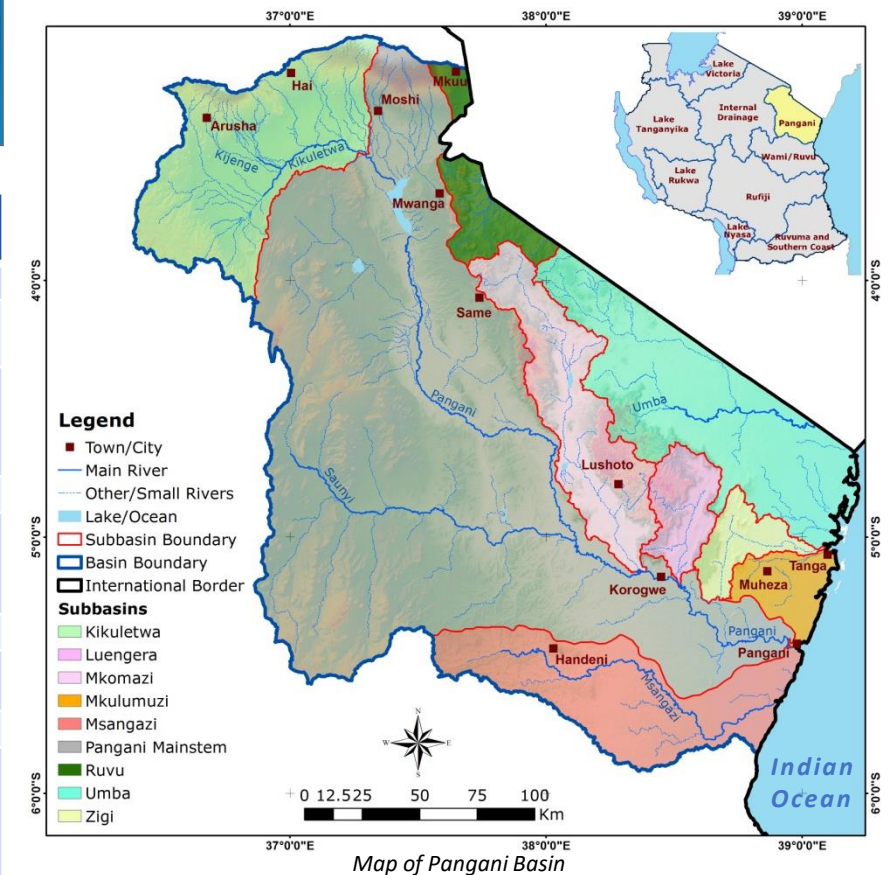
### Hydro-Climatic & Water Resources Profile\*

Average Precipitation	826 mm/yr
Average Temperature	25.1 °C
Average Evapotranspiration	
Potential	1,416 mm/yr
Actual	713 mm/yr
Average Renewable Water Resources	7,970 mcm/yr
Surface Water	7,383 mcm/yr
Groundwater	587 mcm/yr
Water Demands	
Averaged Total	8,266 mcm/yr
Human Consumptive	2,864 mcm/yr
Water Resources Vulnerability Index	36 %

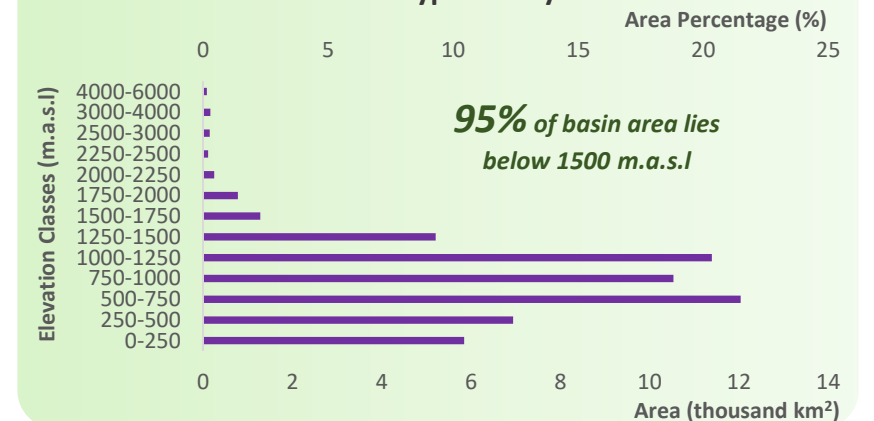
\* According to Pangani Basin IWRMDP, 2015

Tanzania mainland is comprised of nine hydrologic basins. Pangani Basin is the 2<sup>nd</sup> smallest basin that embraces less than 6% of the area of the country. The basin is located in the north-east corner of Tanzania, where it crosses borders with Kenya. Waters that run from precipitation, flow eventually into Indian Ocean, including the small part that enters Kenya.

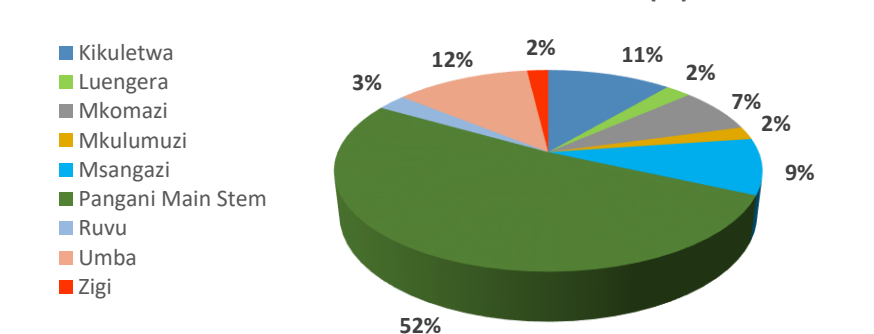
## Water Resources Fact Sheet Pangani Basin



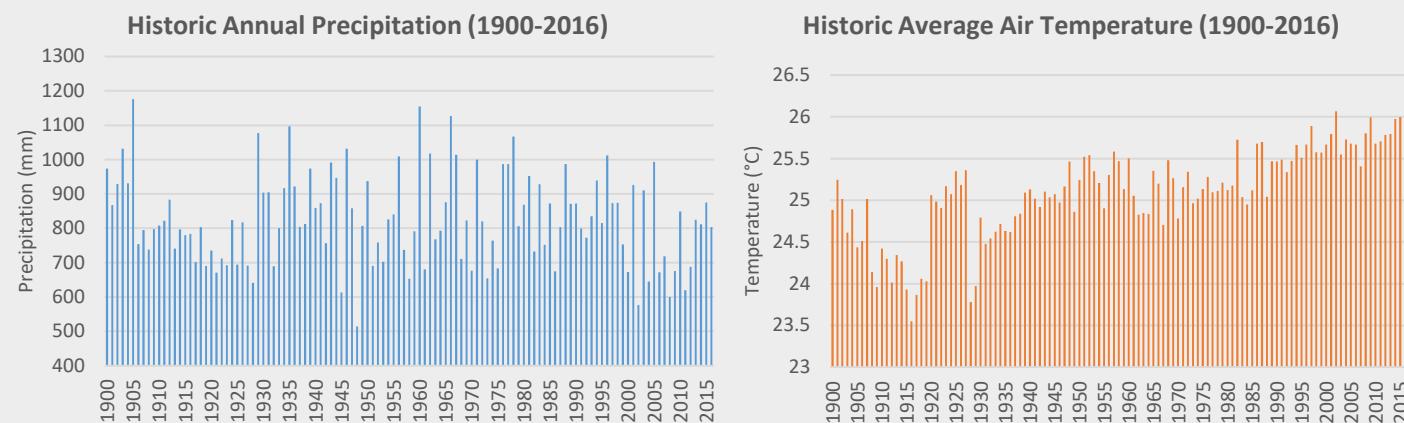
### Land Hypsometry



### Area of Catchments (%)



## Pangani Basin Water Resources Key Figures



Averaged for Pangani Basin; Source: Climatic Research Unit, University of East Anglia, UK; <http://www.cru.uea.ac.uk/data>

### Long Term Rainfall Variation

Rainfall Average 1900-1930	814 mm
Rainfall Average 1985-2016	800 mm
Difference in Long-term Average	- 14 mm

Difference in Rainfall\*: - 1.8%

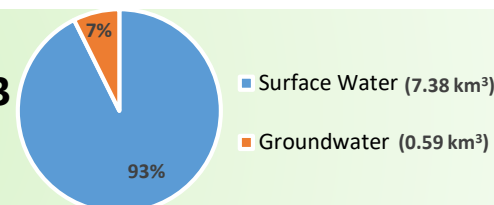
### Long Term Temperature Variation

Temperature Average 1900-1930	24.55 °C
Temperature Average 1985-2016	25.65 °C
Difference in Long-term Average	+ 1.10 °C

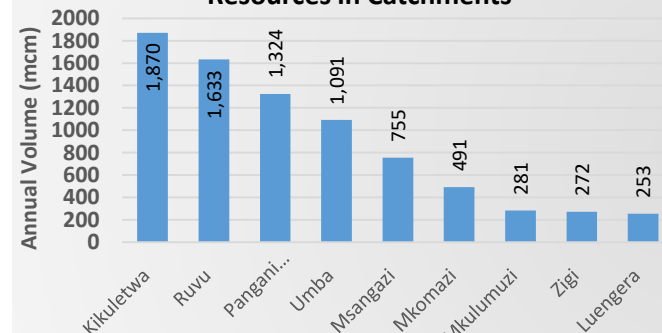
Difference in Temperature\*: + 4.5%

\* Over 85 Years (30-yr average values, centered on 1915-2000)

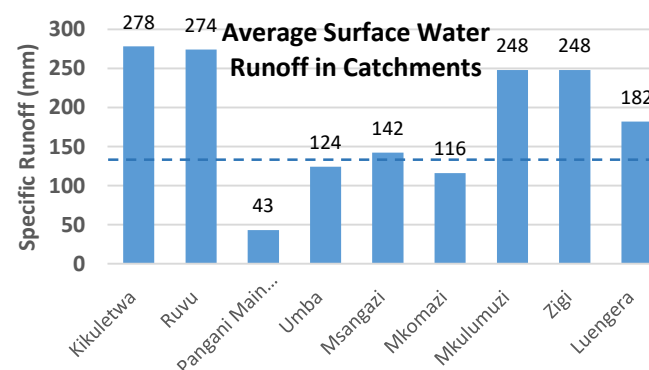
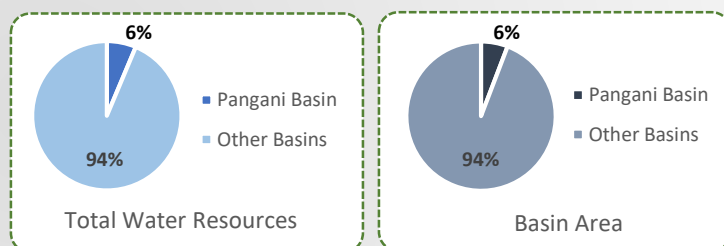
**Annual Renewable Water Resources: 7.97 km<sup>3</sup>**  
(inside Tanzania borders)



### Average Total Renewable Water Resources in Catchments



### Share of Pangani Basin in Tanzania's Renewable Water Resources



Average Country-wide Specific Runoff: 111 mm

Average Pangani Basin's Specific Runoff: 135 mm

There is a large variation of runoff production within different catchments in Pangani Basin:

- Zigi & Mkulumuzi catchments as high as 277% of average
- Pangani catchment as low as 83% of average

Pangani Basin receives in average an annual precipitation of about 45 km<sup>3</sup> out of which as much as 37 km<sup>3</sup> returns back to the atmosphere and 7.97 km<sup>3</sup> (about 18%) turns into surface and ground water as renewable freshwater resources.

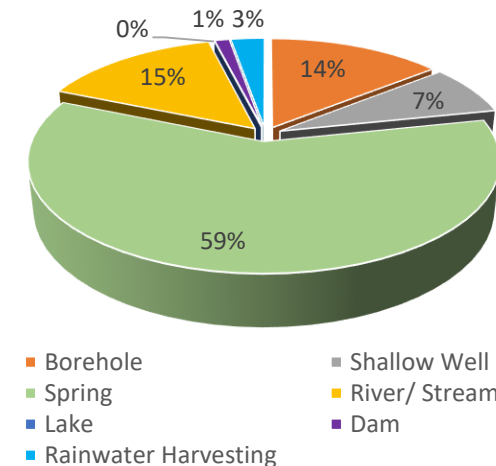
## Pangani Basin Water Infrastructure Key Figures



### Water Infrastructure Profile

<b>Water Points</b>	
No. of Water Points	13,025
No. of Taps	15,583
<b>No. of Monitoring Stations:</b>	
Weather	15
Rainfall	39
Hydrological	72
Hydrogeological	10
<b>No. of Dams and Reservoirs</b>	156
<b>Reservoirs Capacity</b>	1,191.7 mcm
<b>Irrigation Schemes</b>	
No. Area	960 84,473 ha
<b>Irrigation Efficiency</b>	30%
<b>Main Crops (irrigated)</b>	Coffee, Cotton, Maize, Rice, Sorghum, Bananas

### Water Points by Sources of Water



Average Gross Area per Water Point: 4 km<sup>2</sup>

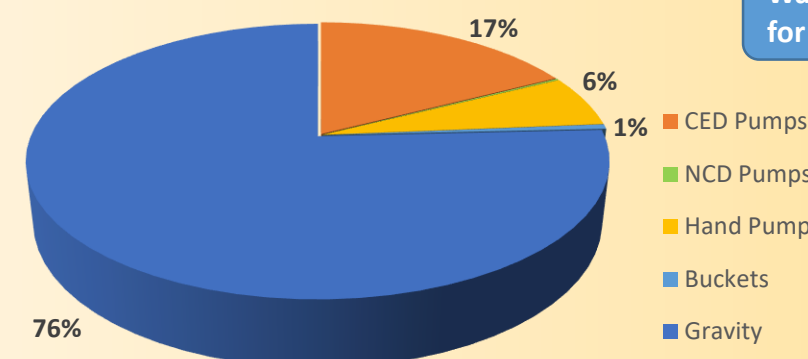
Functioning Water Taps: 11,325

73%

Water Points Supplied by Groundwater and Springs

79%

### Extraction Technologies at Water Points



Water Points that Need Energy for Extraction of Water

24%

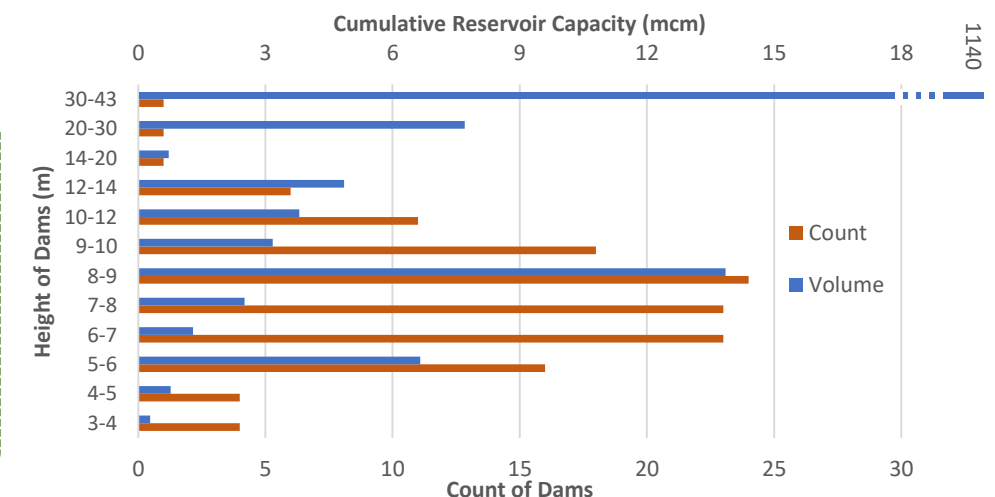
**CED Pumps:** Conventional Energy-Driven Pumps (includes Thermal Electricity, Hydroelectricity, Gasoline & Diesel)

**NCD Pumps:** Non-Conventional Energy-Driven Pumps (includes Solar Electricity, Windmill)

**Hand Pumps:** (includes Lever Pumps, Mono Pumps, Rope Pumps, Play Pumps)

### Statistics of Dams in the Basin

There are 150 man-made dams constructed in Pangani Basin with a total reservoir capacity of about 1,183 mcm. The largest reservoir belongs to Nyumba ya Mungu Dam with a height of 42.7 m and capacity of 1,140 mcm. The dam was constructed in 1967 on upstream part of Pangani river valley in Mwanga District, Kilimanjaro Region.



Water supply access in Tanzania – mainly in rural areas – is realised through "water points", i.e. usually a public place for people to obtain clean water.

Water from water points is potable water consumed for the people or livestock. Means of access to water at the supply points are usually in form of communal standpipes. However, other shapes of access to water are present such as water kiosks, water tanks, hand pumps, developed or undeveloped springs, and cattle troughs.