



**MALINDI WATER &
SEWERAGE CO. LTD**

Water Security and Climate Resilience in Malindi

Innovate4WASH 2022

GERALD MWAMBIRE
MANAGING DIRECTOR, MAWASCO
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malindiwater.co.ke

Malindi Climate

Malindi, which is located at equatorial latitude in the coast of Kenya, has a distinctly hot and humid environment.

Temperature

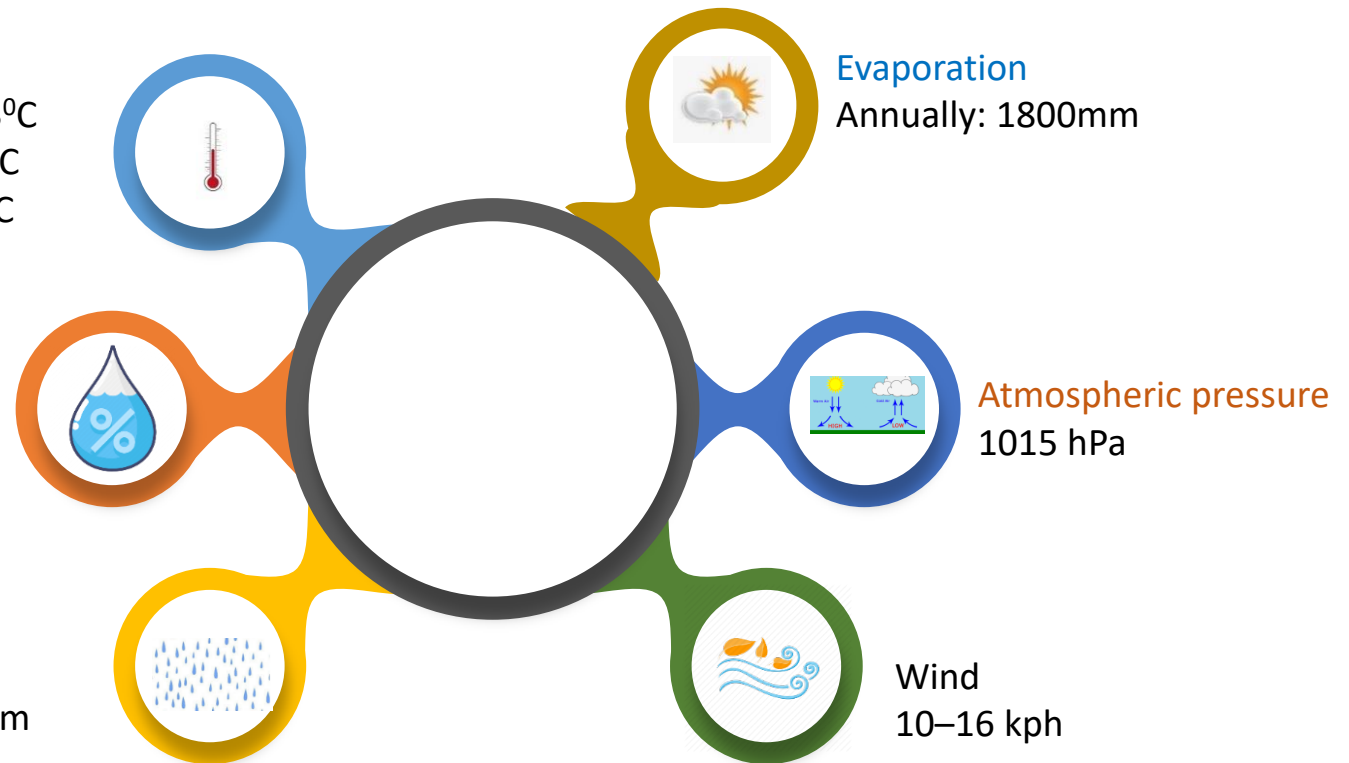
Average Annual: 26.3°C
Warmest Month: 28°C
Coldest Month: 24.6°C
Night: 20 °C

Humidity

Average: 75%

Precipitation

Long Rains: April - May
Short Rains: Oct. – Nov.
Annual Average: 1094mm
Driest Month: 6mm
Wettest Month: 293mm

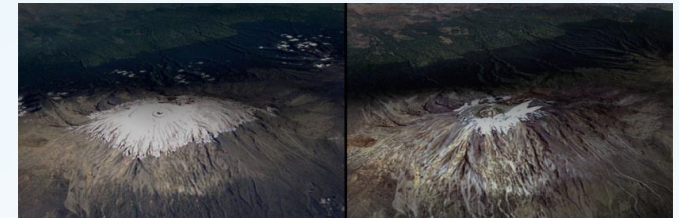


Consequences of Climate Change

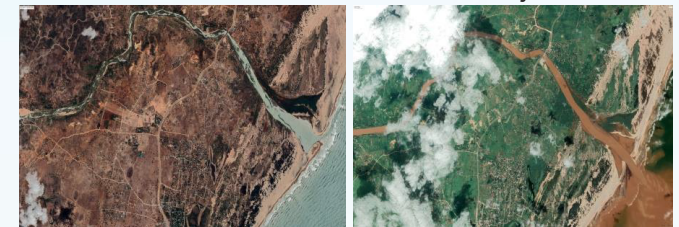
- Melting of Glaciers
 - Melting of glaciers at Mt. Kenya and Mt. Kilimanjaro has reduced water flow in Sabaki River and Mzima Springs respectively
- Rising Sea Levels
 - This can lead to salinity ingress in freshwater aquifers and coastal flooding.
- Flooding
 - Can occur as coastal, riverine , flash or localized flooding.
- Frequent and Lengthy Droughts
 - There are now more dry and semi-arid areas which has led to reduced water volume in rivers.



Reduction of Glaciers at Mt. Kenya



Reduction of Glaciers at Mt. Kilimanjaro



River Sabaki at the End of the Dry Season and at the Peak of the Wet Season



Flooded River Sabaki

Impact of Climate Change on Water Resources

Floods

- Washed away pipes and appurtenances
- Overtopped wellheads
- Damage electrical controls and instrumentation systems
- Shut downs due to power outages



Downed Power Lines

Flooding at Baricho Wells



Damaged Borehole

Drought

- Lowered groundwater levels
- Intrusion of saltwater into aquifers.
- Altered source water parameters
- Damage of pipes due to low water pressure



Washed Away Pipe

Damaged Wellfield



Damaged Borehole Electrical Fittings

Climate Change Adaptation Measures

Floods

- Development of climate resilient infrastructure
 - Concrete protective structures on pile foundations at wells
 - Area protection around boreholes and access roads
 - Elevating structures to a higher level
 - Use of gabions to protect wellfields
 - Access roads would be built to rigid pavement standards to improve accessibility to the water facilities in the wellfields
 - Waterproofing, relocating, or reinforcing distribution system appurtenances



Drought

- Reduction of nonrevenue water.
- Identification and development of alternate sources of water
- Installation of additional storage and pumping equipment



Major Challenges

Major challenges to water security and climate resilience are:-

- Lack of clean and sustainable energy solutions
- Lack of finance
- Lack of sustainable water desalination solutions
- Lack of sustainable water harvesting solutions

What innovative measures can we employ to improve water security and climate resilience?

Thank You!



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