

**WATER RESOURCES
MANAGEMENT IN SUDAN**
Challenges

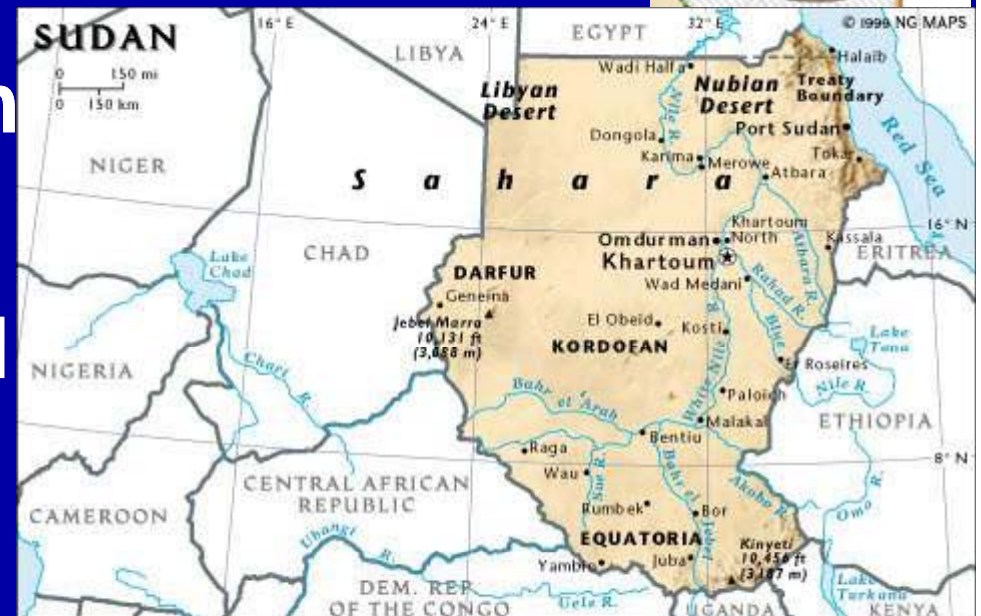
By
Dr:Hassan Abualbashar Ali Hamdoun

Background

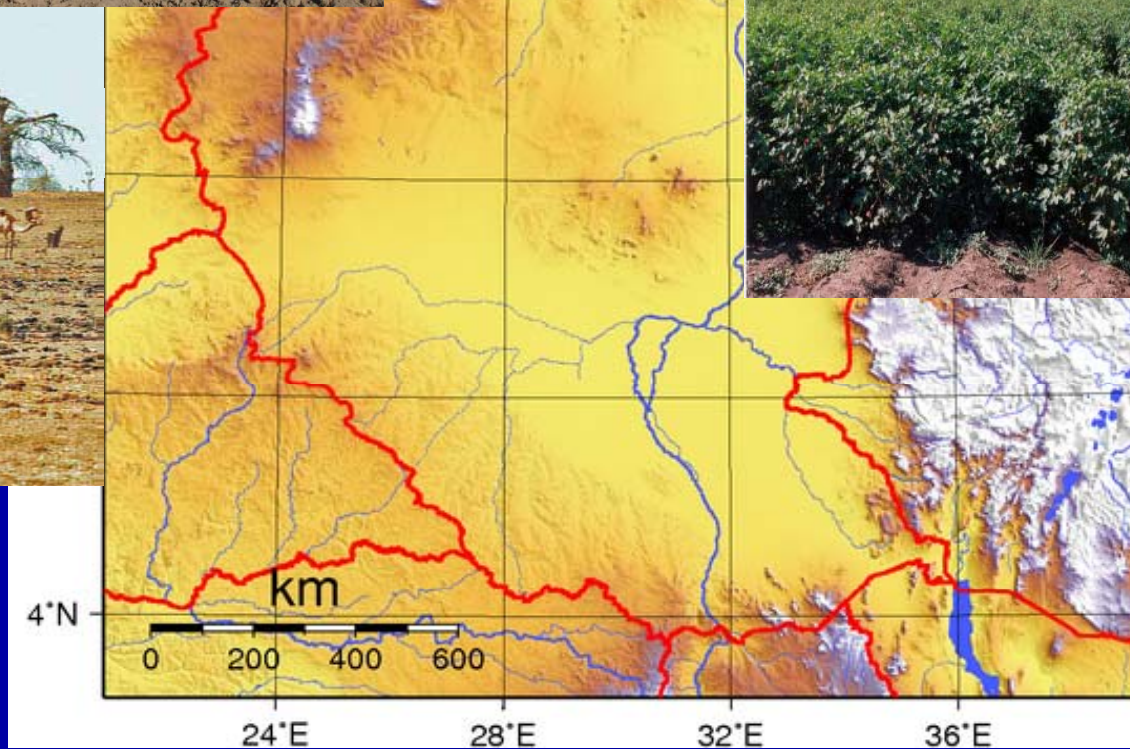
- Location: Between 3 to 23 N & 21 45 To 38 30 E



- Area : 2.5 M sq. Km
- Population : 39.2 M (2009 census)



Diversity in Sudan



Rainfall

Four Zones: (Total RF >1000BCM)

- Desert Zone : 75 mm (36%)
- Semi-Desert : 75 – 300 mm (20%)
- Savannah : 300 – 900 mm (24%)
- High Rainfall Savannah > 900 mm (20%)

Challenges

- **Natural Challenges**
- **Technical Challenges**
- **Economic Challenges**
- **Institutional Challenges**
- **Drought management Challenges**

Challenges

- Efficient and economic use of water resources.
- Legal and institutional framework for water related sectors.



Challenges

- Investment & Funds for sustainable management of water resources.
- Human and institutional capacities in WR.
- Participation of stakeholders.
- Water resources pollution risks and related environmental issues.

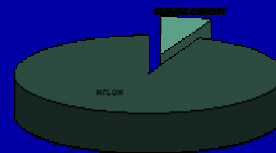
Dam Wall



Debris



% Storage



Natural Challenges

- More than 77% of water resources originates from outside Sudan
- High spatial and temporal variability of rainfall and related uneven distribution in availability of water.
- High sedimentation rates in canals, dam reservoirs (50% of capacity is lost) and inlet channels
- Weed growth in canals and Nile tributaries (Water Hyacinth)

Technical Challenges

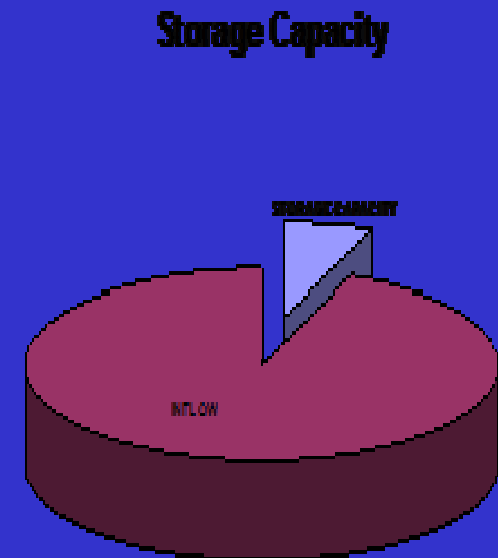
- **Inadequate water resources data (reliable monitoring system) and proper assessment**
 - Inadequate human capacity for the collection, assessment and dissemination of data on water resources for developing, planning and implementing projects
 - Retain staff once they are given the requisite training and appropriate incentives devised
- **Inadequate research and development capacity to carryout effective research programs in the water resources sector**

Technical Challenges

- **Balance between supply and demand and efficient use for irrigation water in agriculture.**
- **More conjunctive use for irrigation from surface and groundwater and solving the problem of drawdown and deterioration.**
- **Increase the water use, particularly rain-fed to match with the available vast land areas.**

Economic Challenges

- Inadequate investments and finance in the water resources sector
- Limited available and expensive power
- Inadequate financial arrangements
- Limited storage vessels (reservoirs)
- Unstable agricultural policies and lack of effective cost recovery mechanisms - Sustainability
- Striking a balance between agricultural uses and hydropower.



Legal & Institutional Challenges

- **The need to enhance regulation and coordination between water related institutions and the different users and avoid fragmentation of Government responsibilities and institutions in the States**
- **Federal body of water resources responsible for strategic studies and planning for development and utilization.**

Human Resource Challenges

- High rate of population growth (2.8%) and change of pattern in water use
- Unbalanced Development & Urbanization
- Lack of awareness and water extension programs

Institutional Challenges

**Implementation of IWRM under
Federal System**

**Let us work together to deal
with the question**

**How to develop drought
monitoring system?**

Thank you