WATER CONVENTION

Global Workshop
on Droughts in Transboundary Basins
26-27 February 2024, Geneva

Management of groundwater an surface water in transboundary basins in the Arab region (Monitoring – Data exchange)

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UNECE
Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra
Bundesamt für Umwelt BAFU Office fédéral de l'environnement OFEV Ufficio federale dell'ambiente UFAM Uffizi federal d'ambient UFAM
United Nations Convention to Combat Desertification
UNDRR UN Office for Disaster Risk Reduction
WORLD BANK GROUP Water
WORLD METEOROLOGICAL ORGANIZATION
INTERNATIONAL NETWORK OF BASIN ORGANIZATIONS

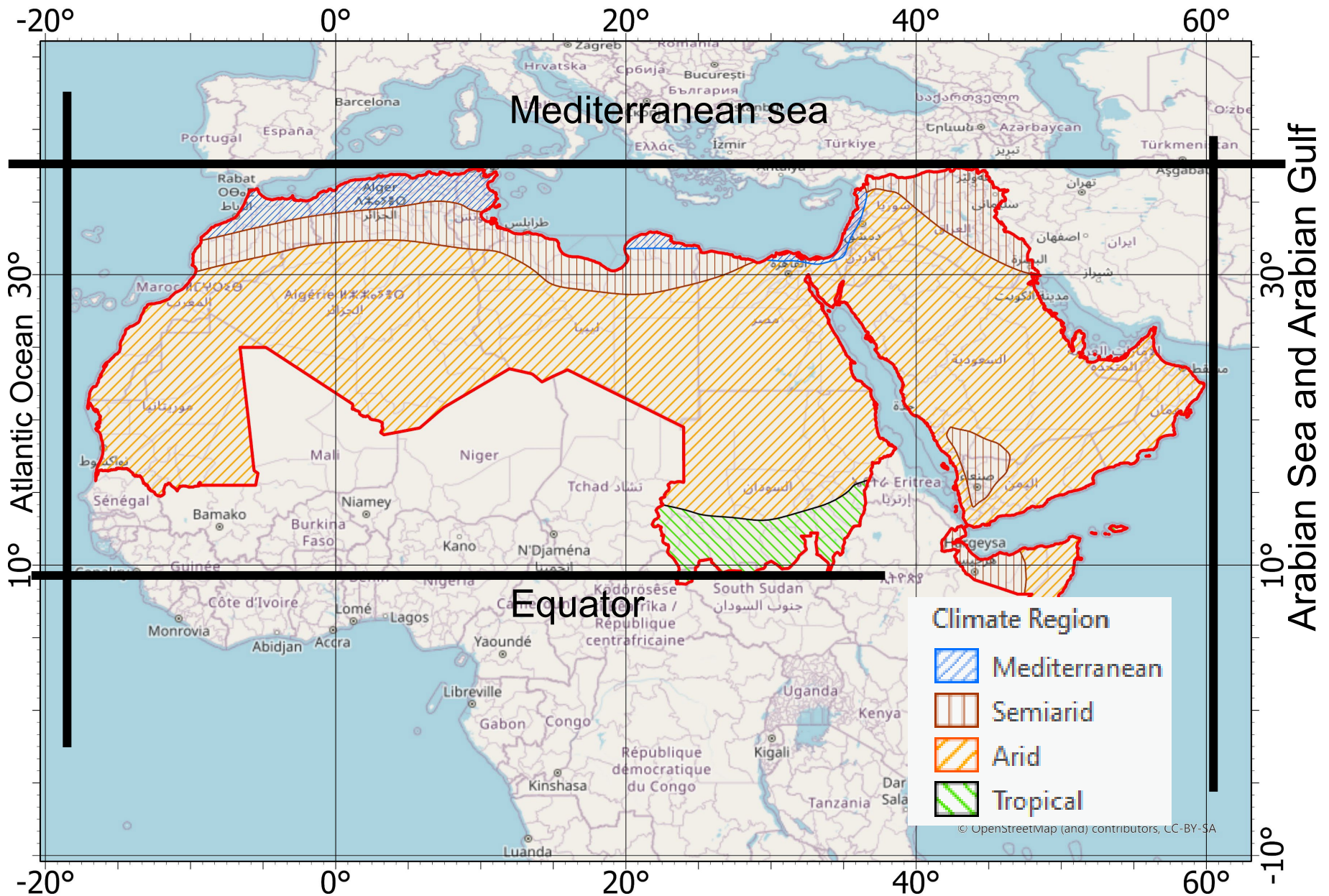
The Arab region

- **Boundaries**.
- **Area**: 14 M.Km2, & **Total Population** 430 M. Inhabitants
- **Shared Water** = 2/3 of fresh water resources
- **27** shared Surface water basins
- **14** of 22 Arab countries are riparian States with a shared waterbody
- **Traditionally the region faces drought events with increasing number of droughts, leading to vulnerabilities in agriculture and food and water securities and impacting livelihoods.**
- **Some adaptation measures :**

I. water conservation (Improved Irrigation Practices)

II.Diversification of Water resources & Crops

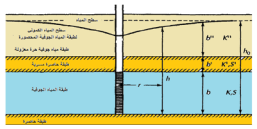
III.Policy Measures (Raising Awareness & Alarm systems)



Water Resources Monitoring

Groundwater

Quantity



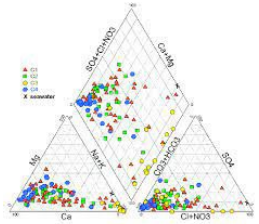
Groundwater Level

Springs discharge

Groundwater Abstraction

Quality

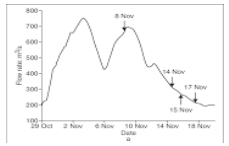
Salinity



Ions / Cations Concentrations

Surface Water

Quantity



River Discharge

Dams & Lakes Storage

Quality

Water Usage

Salinity, Ions, Toxic Substances

Main water resources drought Indicators

Facilities

Groundwater Monitoring Network

River & Springs Gage Stations

Laboratories

Sampling Team

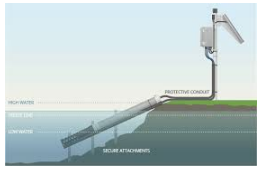
Tools

Manually

Groundwater Level Meter

Current Meter

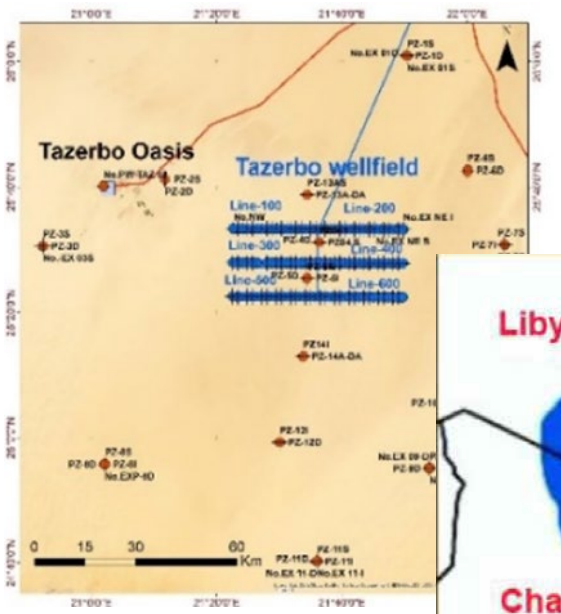
Automated

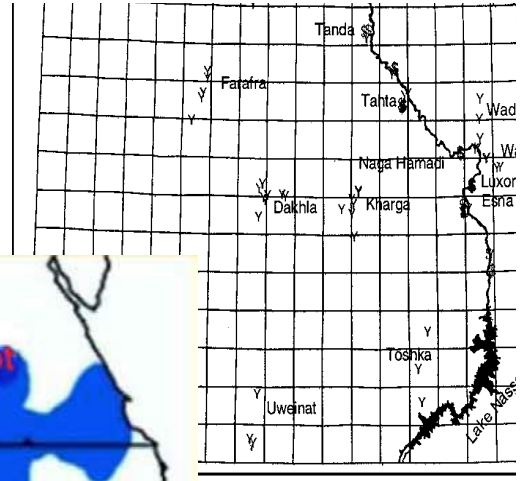


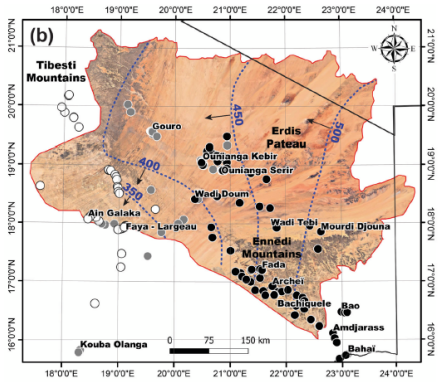
automatic groundwater level &river stage monitoring device

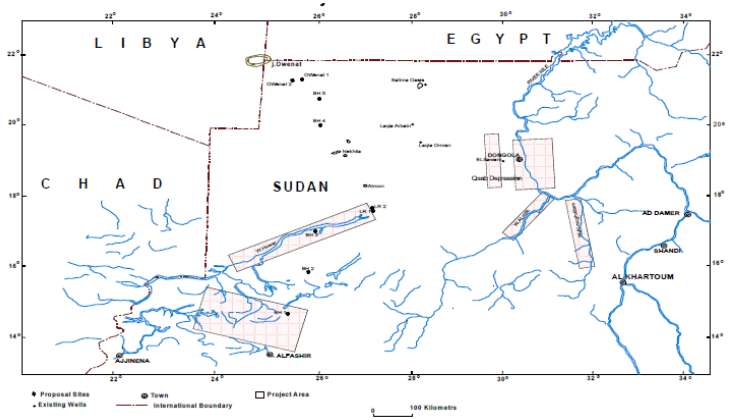
Example of Water Resources Monitoring

Groundwater



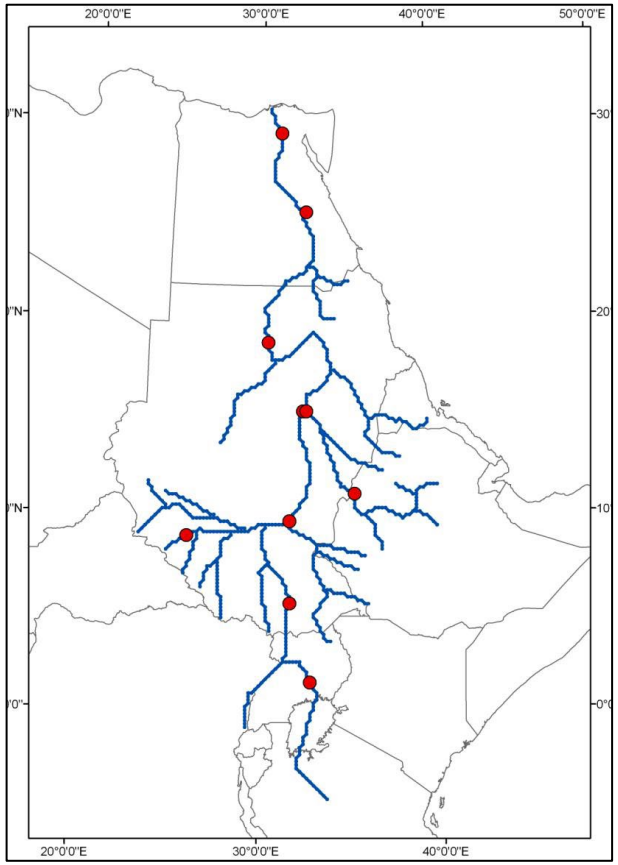


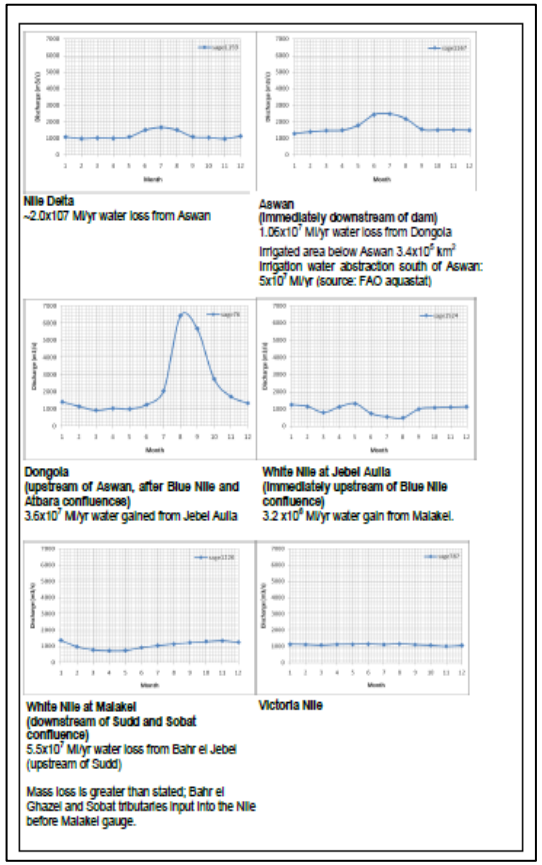




Nubian Sandston Aquifer System Groundwater monitoring network

Surface Water





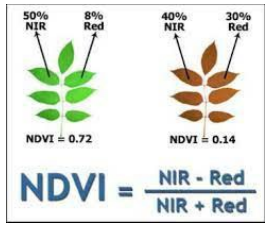
According to measurements taken at the #Juba gauging station, the Nile's water level has risen to 13.05 meters, posing a major threat to #SouthSudan's already bad flood situation.

Gauging stations on the Nile and tributaries

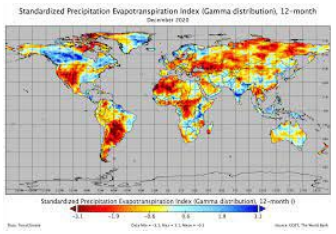
Drought Monitoring

Remote Sensing

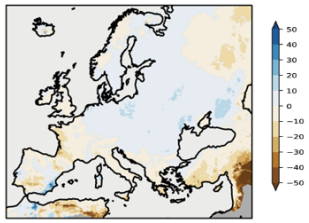
Main Indicators



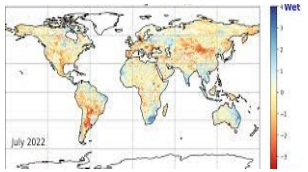
NDVI -Normalized Difference Vegetation Index



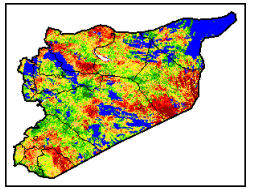
SPI - Standardized Precipitation Index



SMP -Soil Moisture Percentile

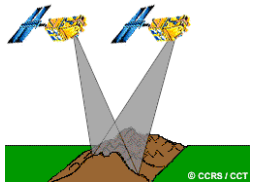


SMDI - Soil Moisture Deficit Index

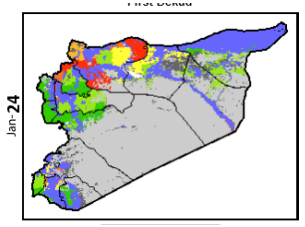


VHI - Vegetation Health Index

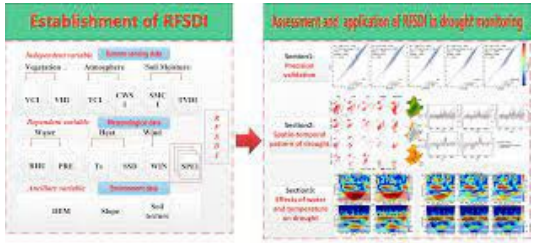
Advantages



large spatial and temporal resolution.

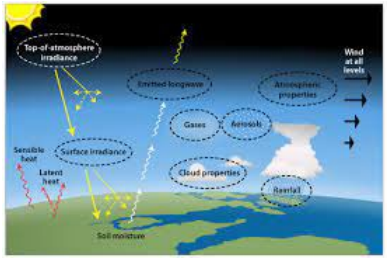


near-real-time drought analysis

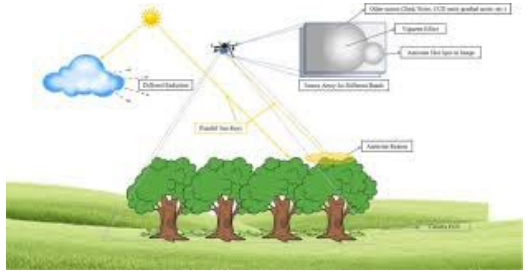


integration with other data sources and models

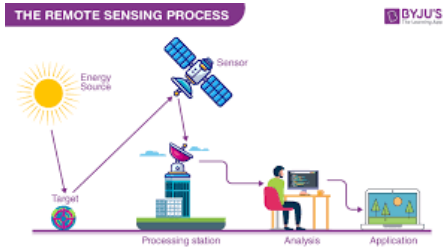
Disadvantages



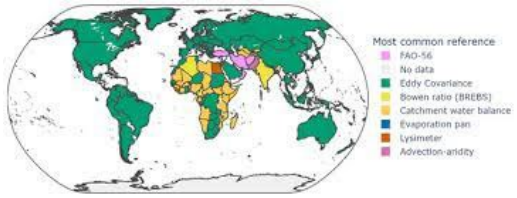
atmospheric conditions



sensor errors



calibration issues



uncertainties and errors in estimating drought

Remote sensing is a valuable yet not standalone tool for drought monitoring. It needs to be supported by ground-based observations, meteorological data, hydrological models, and socio-economic indicators to offer a thorough and precise evaluation of drought conditions and risks.

Drought Monitoring / Remote Sensing

Example

Food and Agriculture Organization of the United Nations

العربية 中文 English Français Русский Español

Earth Observation

GIEWS

Seasonal Global Indicators | Global Indicators | Country Indicators | Data Access | FAQs | Reference | Research | Partners

Country ASIS

The country level maps and graphs depict the latest 36-month period of the seasonal, vegetation and precipitation indicators. The data is presented by dekad and month. ⊞ More

DISCLAIMERS

The boundaries and names shown and the designations used on the maps do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries.

Syrian Arab Republic

Another country:

Seasonal Indicators | Vegetation Indicators | Precipitation Indicators

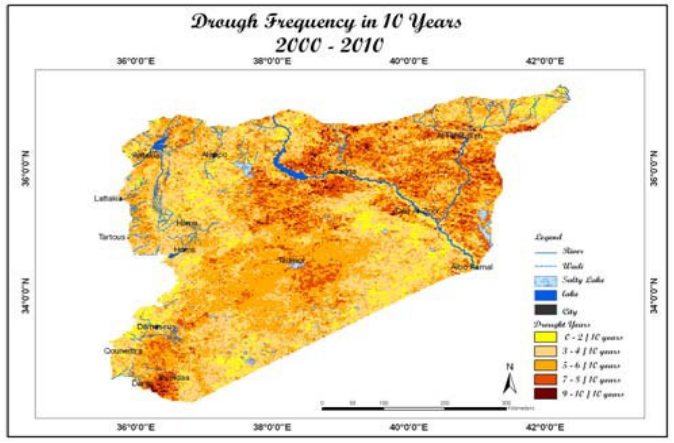
Cropland | Grassland

Near Real Time (10 days) | Annual Summary | Historic Drought Frequency | Crop-growing Season

Season 1 | Season 2

Agricultural Stress Index | Drought Intensity | Weighted Mean Vegetation Health Index

Agricultural Stress Index ⊞ More

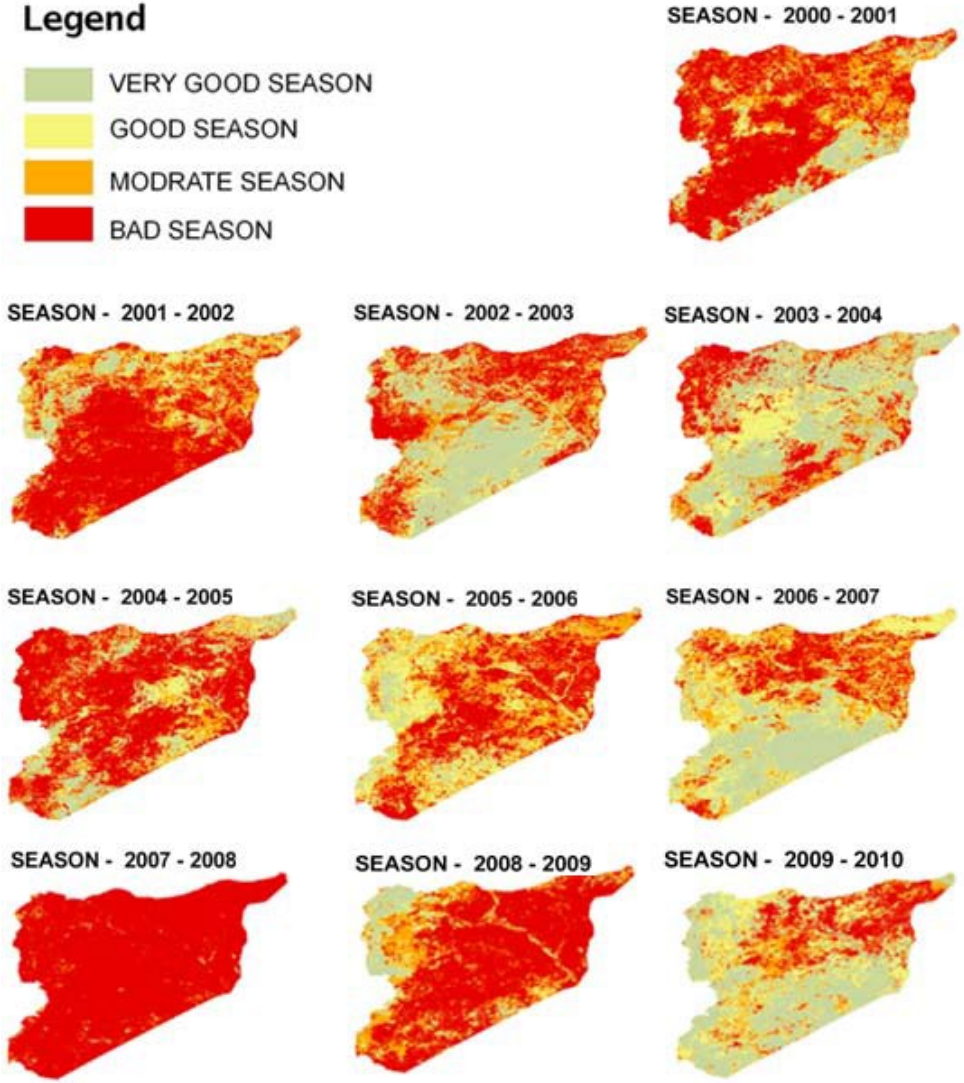


Drought Frequency in Ten Years

VEGETATION HALTH INDEX

Legend

- VERY GOOD SEASON
- GOOD SEASON
- MODRATE SEASON
- BAD SEASON



Water Resources / Data Exchange

Old Traditional Way

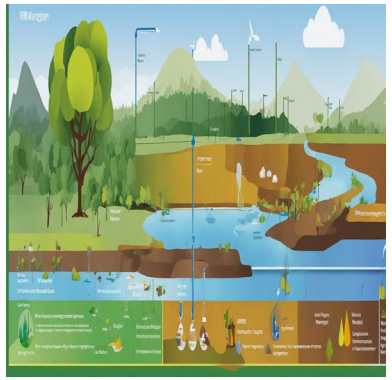
Exchanging documents and data at meetings and official correspondence between joint water committees and ministries of water resources in riparian countries

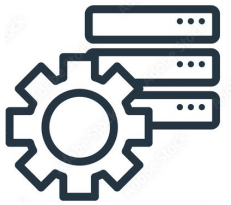
Digital Databases

Design and implement digital databases that receive data related to drought indicators related to water resources and provide access to them for specialists and decision-makers

Advantages

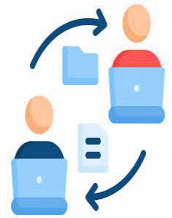
- IWRM in Transboundary Basin
- Information data accuracy & reliability
- Exchanging of knowledge & understanding of water resources in Transboundary Basin



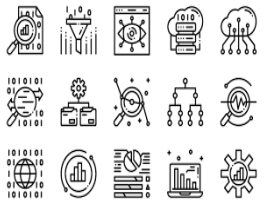


Efficiency

Accuracy



Collaboration



Customization

Security

Disadvantages

- Conflicting and divergent data and information may complicate the process of water resources management
- Sharing sensitive information and data may pose a challenge .
- may raise the issue of ownership and accessibility

Cost

Maintenance

Complexity

Data Privacy

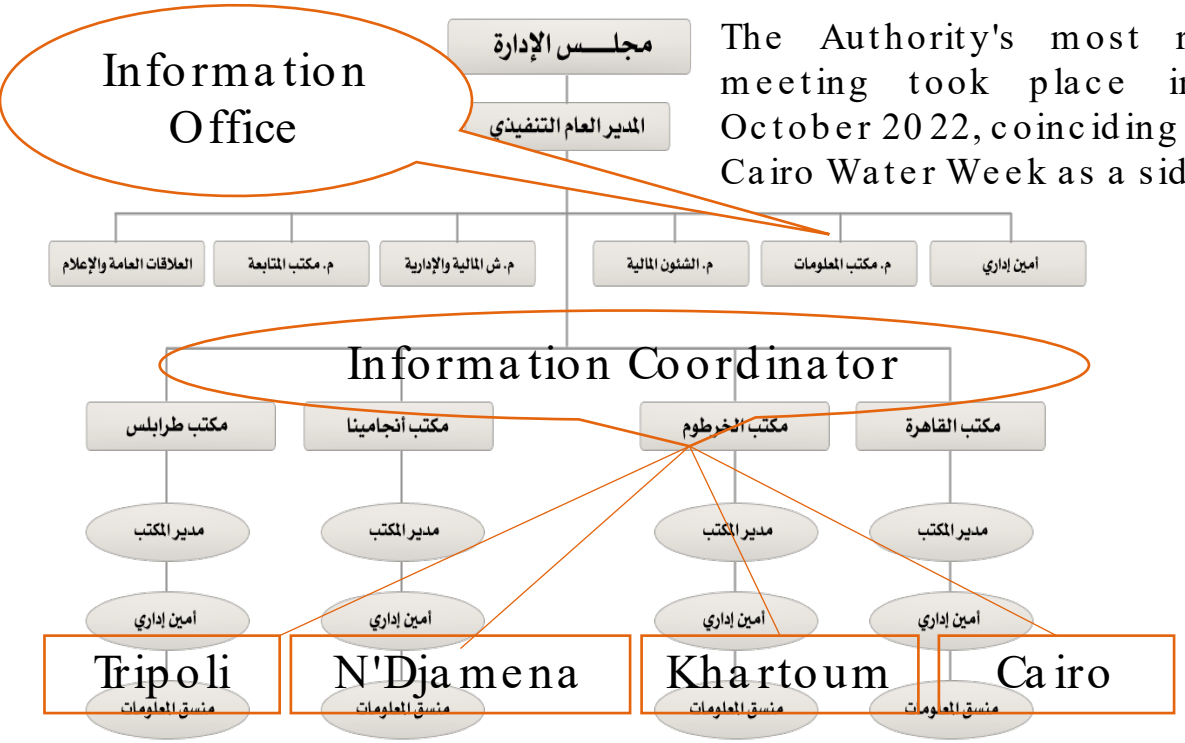
Example Data Exchange / Nubian Sandstone Aquifer System

According regional strategic action programme for the NSAS

Regular exchange of data → Management framework → Policy document, (strategy & management principles)

1a.5: Implement, maintain and utilise a transboundary monitoring network and information database providing comparable information to assess the status of water and biological resources of the NSAS

Old Traditional Way / Joint authority for the Development and studies of the NSAS



The Authority's most recent joint meeting took place in Cairo in October 2022, coinciding with the 5th Cairo Water Week as a side event.

Digital Databases (Examples / Non Arab Regions)

- Aral Sea.
- River Plata Basin
- Mexico-US Basin
- BIO-PATEAUX Project
- ……

Almost all each Arab country has National Water Resources Database

Lessons Learned

Related to monitoring

1. **It is necessary to train a technical staff capable of carrying out manual and digital measuring work with integrity, efficiency and high professionalism.**
2. **There must be an incentive system that strengthens the sense of responsibility and ownership of the measurement system to ensure its sustainability.**
3. **The digital monitoring system is necessary in order to achieve speed and efficiency of measurement work, especially in developing early warning systems**
4. **Periodic manual measurements can be a verification method to ensure that the digital system is working properly**
5. **The ground observation system must be supported by a digital computer system that benefits from remote sensing operations and global climate systems to complete and verify data.**

Related to data Exchange

1. **Data management is the practice of collecting, organizing and utilizing data as valuable assets in the management of water resources in transboundary basins.**
2. **Data management should include processes such as sourcing, transforming, cleaning, storing, protecting, analysing and sharing data.**
3. **Data sharing is the process of enabling access to and use of data by different parties in riparian states.**
4. **Data exchange is an essential process in water resources management in transboundary basins because it contributes to improving efficiency, cooperation, innovation and decision-making in these basins.**
5. **Designing digital databases helps reduce errors and costs and increase speed, quality, and compliance.**
6. **When designing digital databases to exchange data, it is necessary to:**
   - **Apply electronic data interchange standards (rules and agreements that specify how data is exchanged between different systems and applications).**
   - **Having appropriate platforms, protocols, policies and security.**
   - **Find a common language for data exchange and create a framework for data formatting, message structure, and content.**

Thank you
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