Assessment of the Water-Food-Energy-Ecosystems Nexus in the North-West Sahara Aquifer System: the approach

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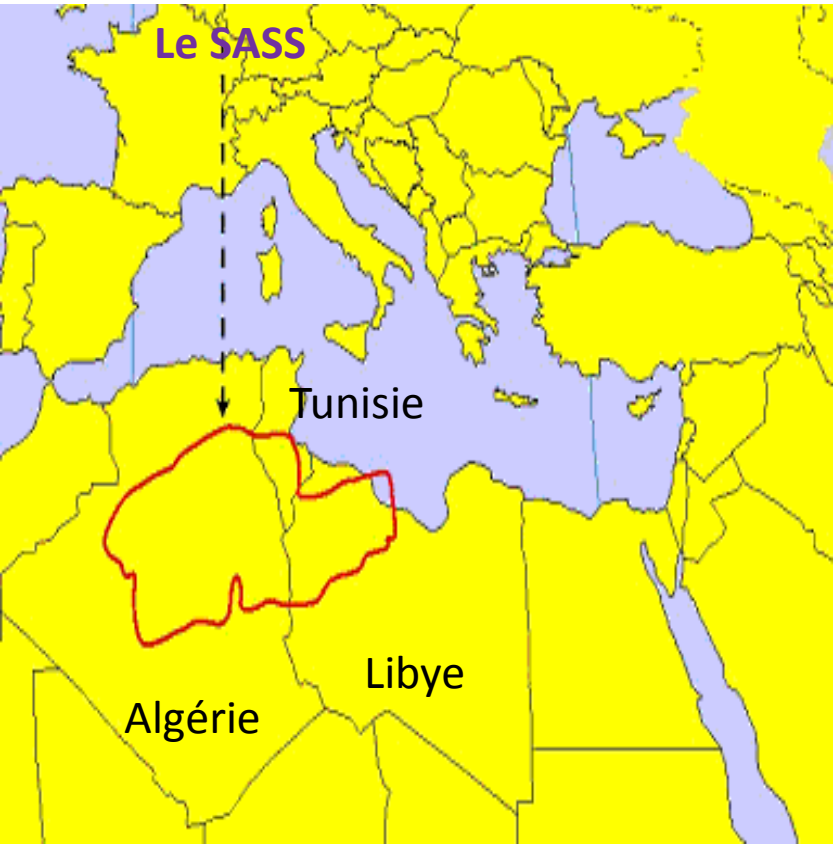
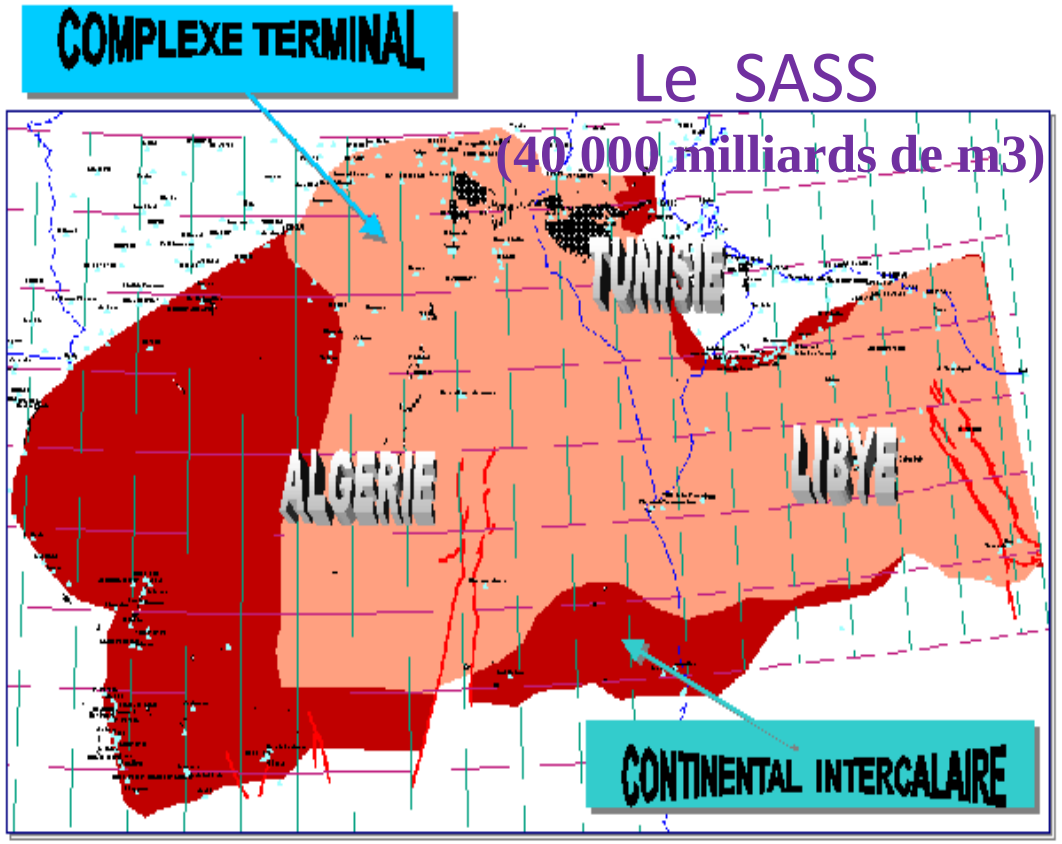
North-West Sahara Aquifer System

Two main superimposed deep aquifers :
a) Continental Intercalaire, **CI** (lower, deep)
b) Complexe Terminal, **CT**.

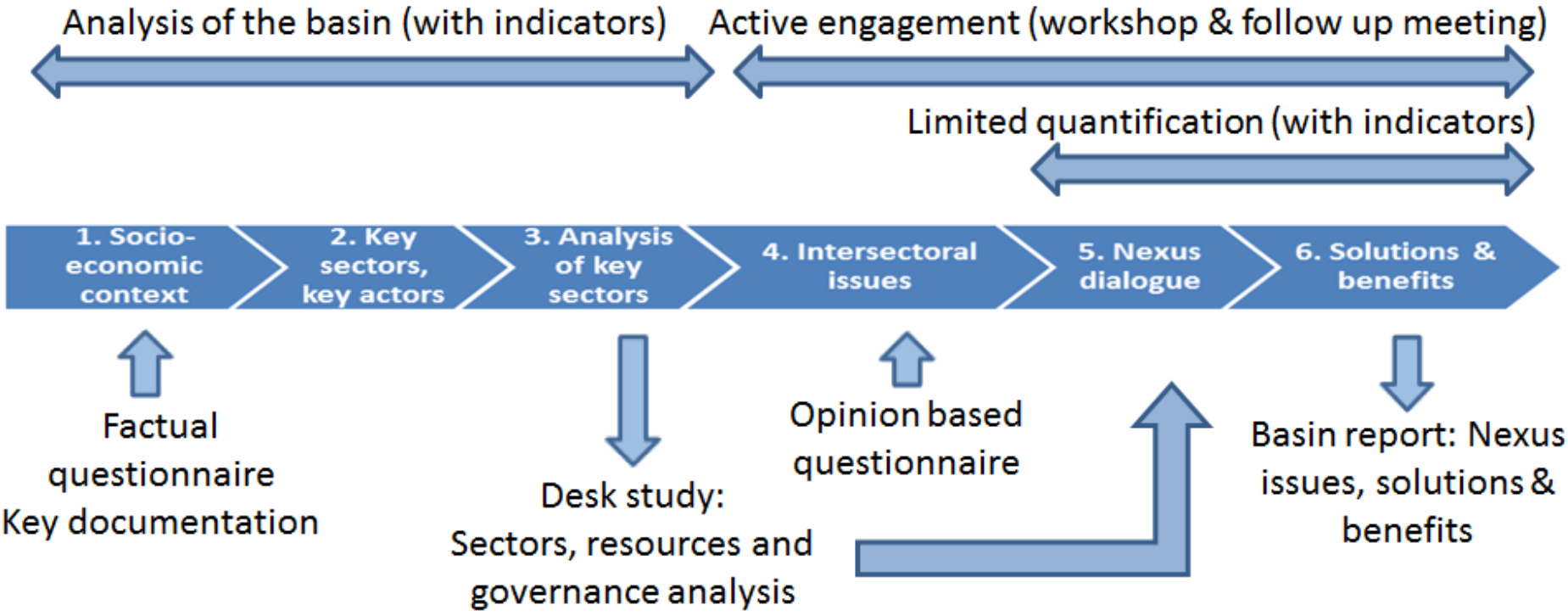
Surface area covers some million km^2 of which 700,000 (60%) is located in Algeria, close to 80,000 (10%) in Tunisia, and 250,000 (30%) in Libya.
Due to the Saharan climate condition, these aquifers have a low level of contemporary recharge: some **1 billion m^3/year** in total.





Nexus assessment methodology

- Adapts to the context and the issues specific to the basin
- Provides for identification of cooperative ways to tackle nexus challenges in a non-prescriptive, inclusive and indicative manner highlighting a broad range of potential opportunities.
- Experience from application to 5 transboundary basins



Background

- Tunisia proposed assessing NWSAS in response to the call by UNECE in early 2013
- Meeting of the Consultation Mechanism of the NWSAS (Algeria, 20-21 Nov. 2013) - NWSAS Countries: Supported the preparation of a Nexus assessment
- Guidance from HE M. Saad Seddik (meeting on 3 June 2015) to develop collaboration on the Nexus being a priority theme for Tunisia
- Nexus assessment of NWSAS as part of a regional MENA wide GWP Mediterranean led project Making Water Cooperation Happen in the Mediterranean; approved by SIDA in 2015
- Consultation mission by GWP-Med and UNECE to Tunis in June 2016
- Focal points for the project nominated by Algeria and Tunisia

Why a nexus approach to the NWSAS?

Situation: groundwater abstractions are double the estimated renewal rates; Risks from abstraction, water quality, salinization, soils degradation and dependent ecosystems. Further water scarcity due to climate change and increased irrigation requirements -> **intersectoral can highlight new opportunities**

National & regional development

- Has implications, also across borders
- Projects and plans commonly sectoral, but their effects cut across sectors –> Can create vulnerabilities

Therefore, the nexus approach combined with a study of benefits can help

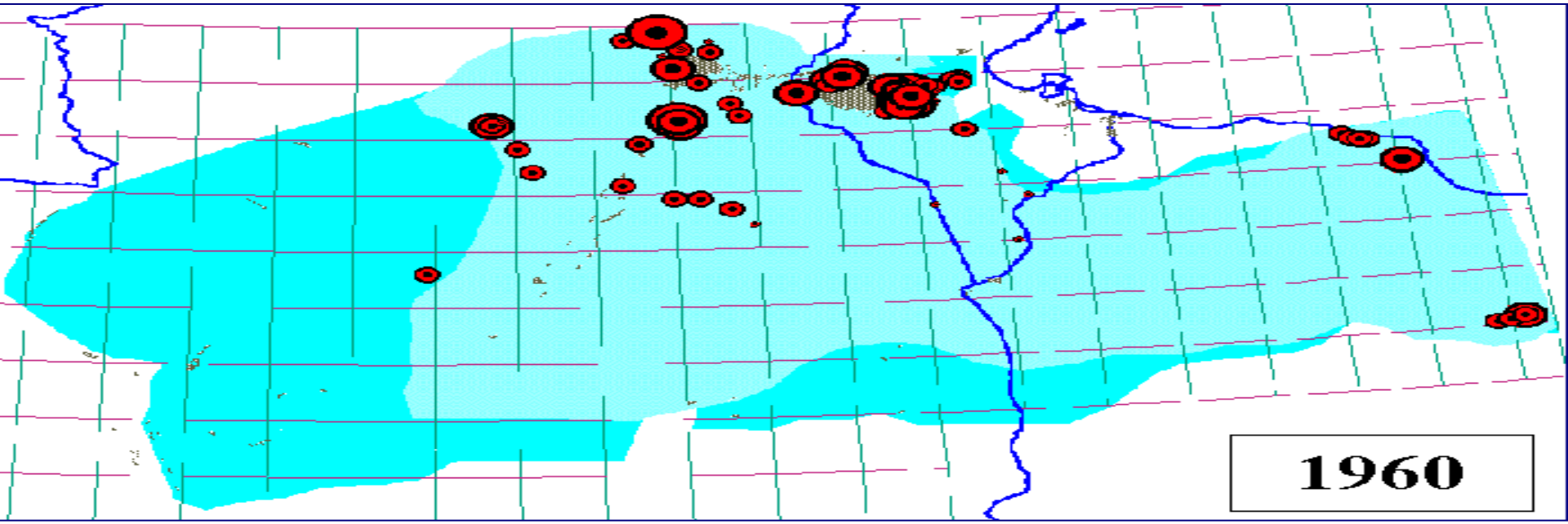
- Exploring policy inconsistencies and potential shared benefits
- Better understanding the interconnections
- Informing dialogue
- Selected quantification for operational solutions

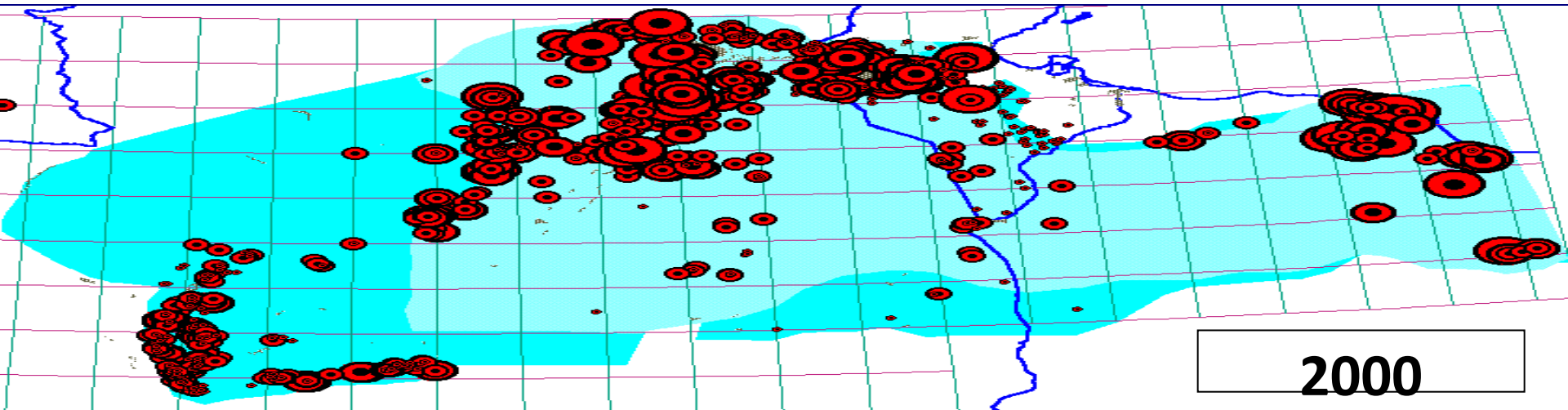
Main stages of assessing NWSAS

- Assessment of the water-food-energy-ecosystems nexus based on the UNECE Methodology
- Desk study
- Conduct of a consultation process to support the identification of opportunities for intersectoral benefits and development of alternative development options; 2 transboundary workshops + national workshops
- Detailed technical assessments on selected items/themes as identified as priorities in need of further analysis with the countries
- The above work informs development of a Strategic Shared Vision on water

Surexploitation du SASS
9000 points d'eau : Forages, Sources et Fouggaras

Algérie	Tunisie	Libye
6500	1300	1200





Some issues that could be looked into

- Viability of rural livelihoods (limited economic opportunities, migration)
- Sustainable Development Goals: contribution to achievement of the relevant targets (e.g. energy access and RES, food security etc.)
- Different energy solutions for pumping and treatment/desalinization?; synergies with national RES strategy; maintenance of infrastructure
- Optimizing efficiency in water use, a better matching of water quality and purpose of use
- Need to develop and modernize agriculture, increase productivity and value
- Comparative advantages of different irrigation techniques
- Developing cascade use of thermal water used for heating greenhouses
- Potential of managed aquifer recharge to reduce losses, complete treatment
- Improved reuse and management of drainage waters
- Address ecosystem degradation; mutual benefits with tourism?

Some concluding remarks

- **The nexus assessment methodology has proven value in facilitating intersectoral transboundary dialogue in several river basins**
- **1st application to an aquifer in NWSAS will a pioneering experience**
- In the NWSAS, although there is information about the aquifer characteristics and agriculture/irrigation, **links to energy have not been explored**
- An active participation and commitment from the countries necessary to shape the process into a valuable exercise, focusing on relevant policy issues; identification of common interests. **Challenge: Ensuring a sufficiently broad participation of all relevant sectors**
- The national authorities in a key role regarding identification of issues and key stakeholders to be involved
- Adequate information and data on the issues necessary for policy relevant analysis to support decision-making
- **Effective cooperation between local and international experts**