

**GEOSS Joint Asia – Africa Water Cycle Symposium
in Tokyo, Japan 25 – 27 November 2013**

**Project Design Matrix preparation for
Medjerda basin**

Medjerda at BouSalem

Z. Bargaoui⁽¹⁾, M. Rekaya⁽²⁾

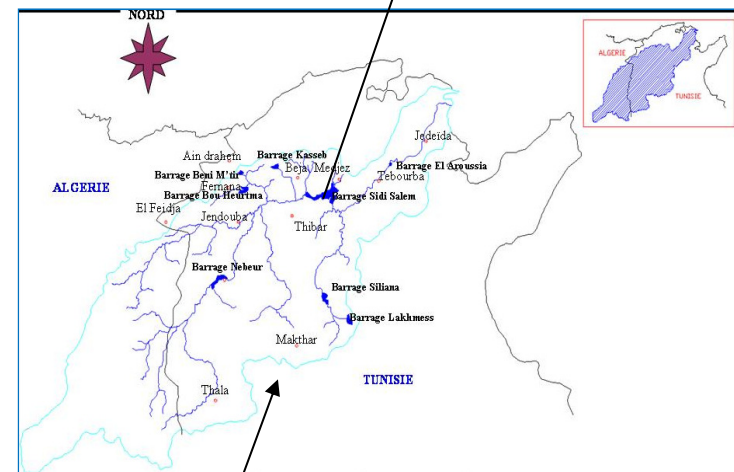
1: Prof. Université Tunis El Manar, 2: Dr, Head DGRE Ministry of Agriculture

Medjerda basin

- Medjerda is a **Tran boundary river**. About the third of its watershed is located in Algeria.
- Nearly 22 000 km²
- 13% of population live there
- **Water tower of Tunisia**
- Importance of the basin for **drinking water and Agriculture sector**



Sidi Salem dam (750 Mm³)



18/11/2013

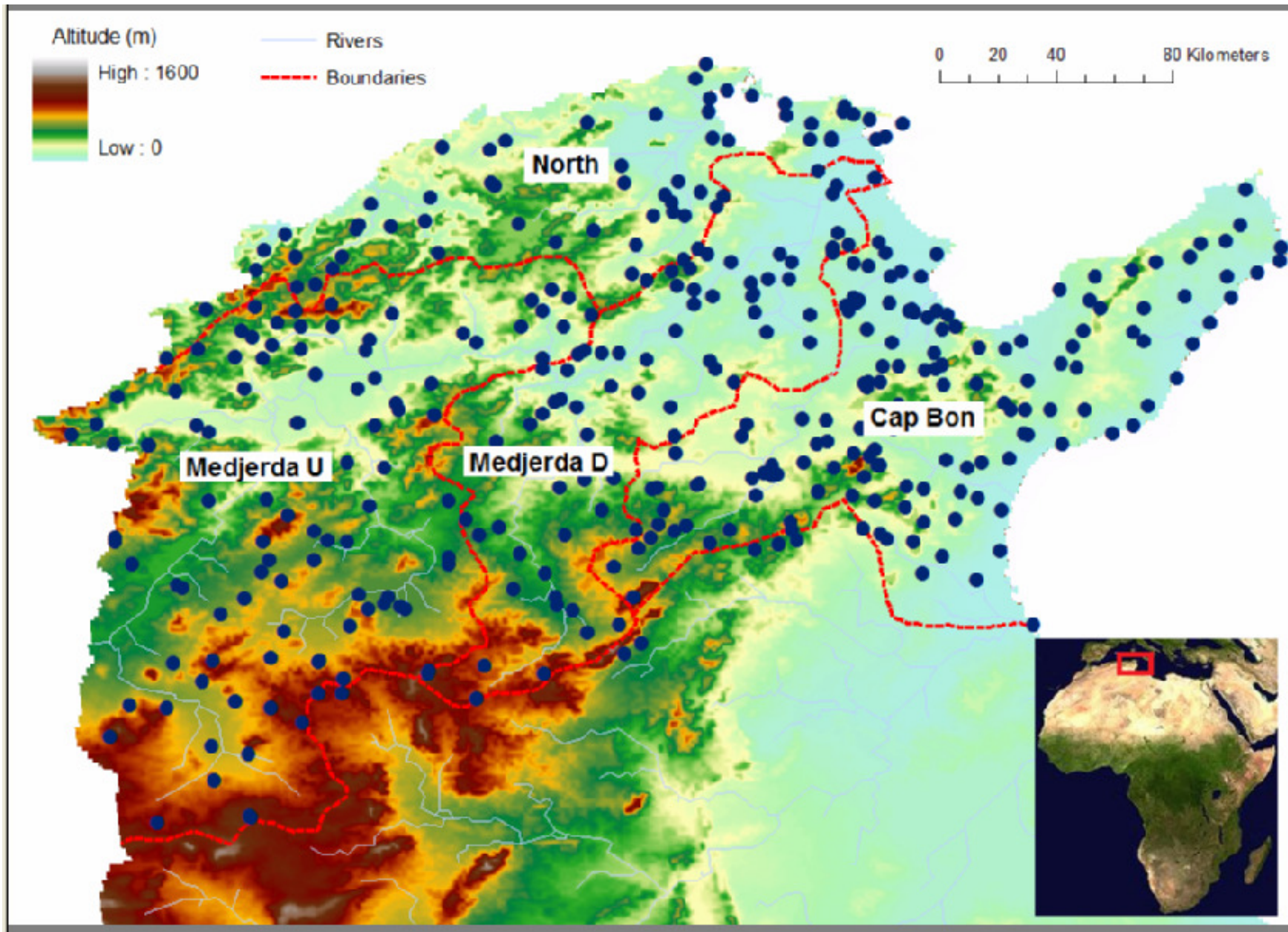
Dams in Medjerda basin

Problematic

- Several generalized floods occurred in the past (1969 et 1973)
-
- as well as in recent years (2000, 2003, 2004, 2005, 2009, et 2012),
- **Multi objectives dams and conflict objectives** : flood protection, drinking water furniture, irrigation with all maxima in summer season
- **Downstream** Sidi Salem dam (750 Mm³) is a **flood plain** (nearly 2 millions of people) **with urbanization, agricultural and industrial activities**
- Upstream dams are inter connected (5 great dams)
- **Upstream dams in Algeria** are also in operation

Sound of existing situation

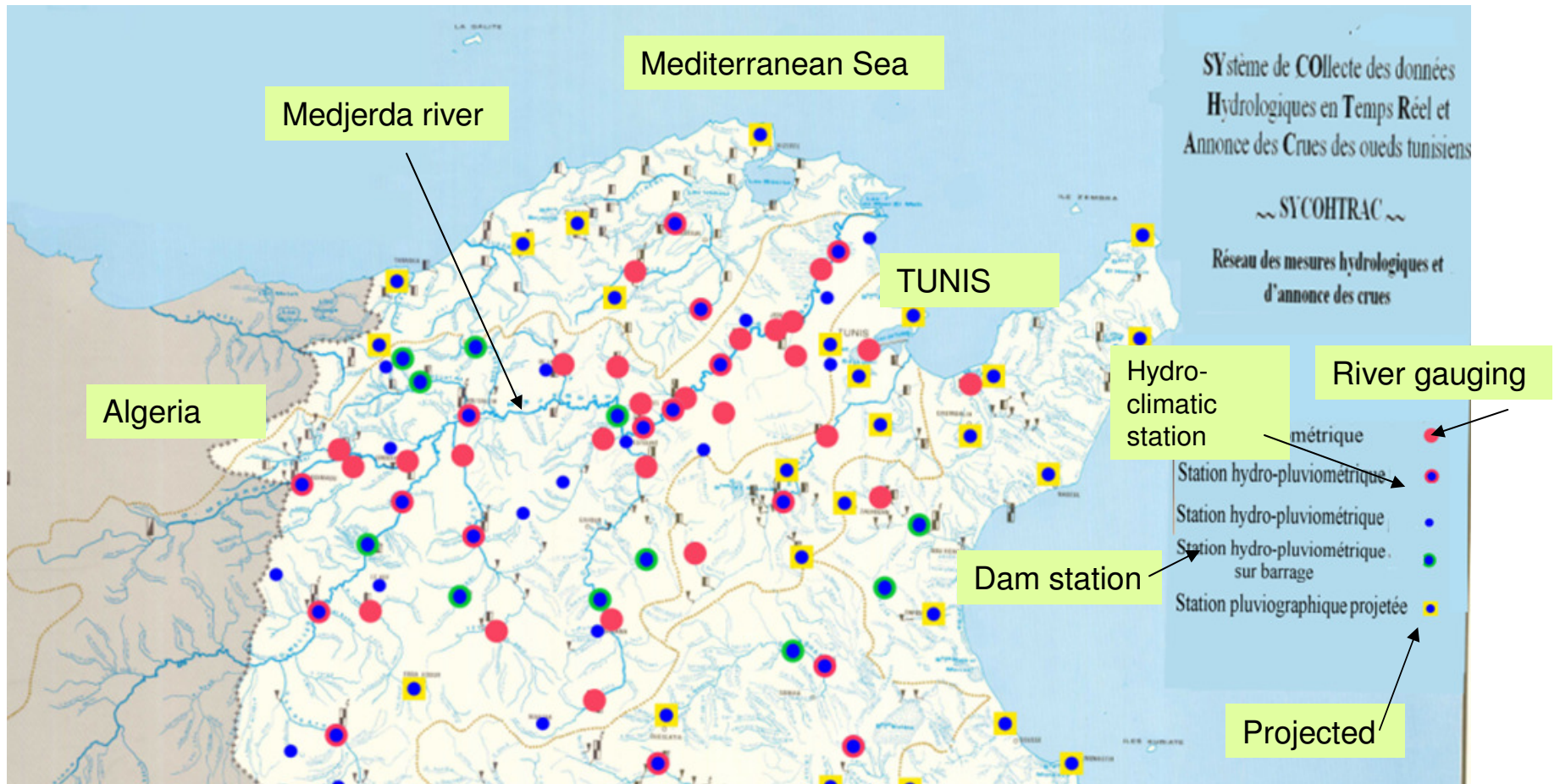
- Availability of observation networks
- Availability of databases
- Availability of information systems GIS
- No basin authority (6 regional authorities (CRDA) under national authority Ministry of Agriculture)
- Important Studies with DGRE as coordinator
 - **Piseau I** : 2001-2007; 328 MDT (BIRD, AFD, AfDB) – Irrigation- Drinking water- Ground Water /SINEAU (information system)
 - **Piseau II** : 2009-2014; 216 MDT (BIRD, AFD, AfDB) – Irrigation- Drinking water - WRM



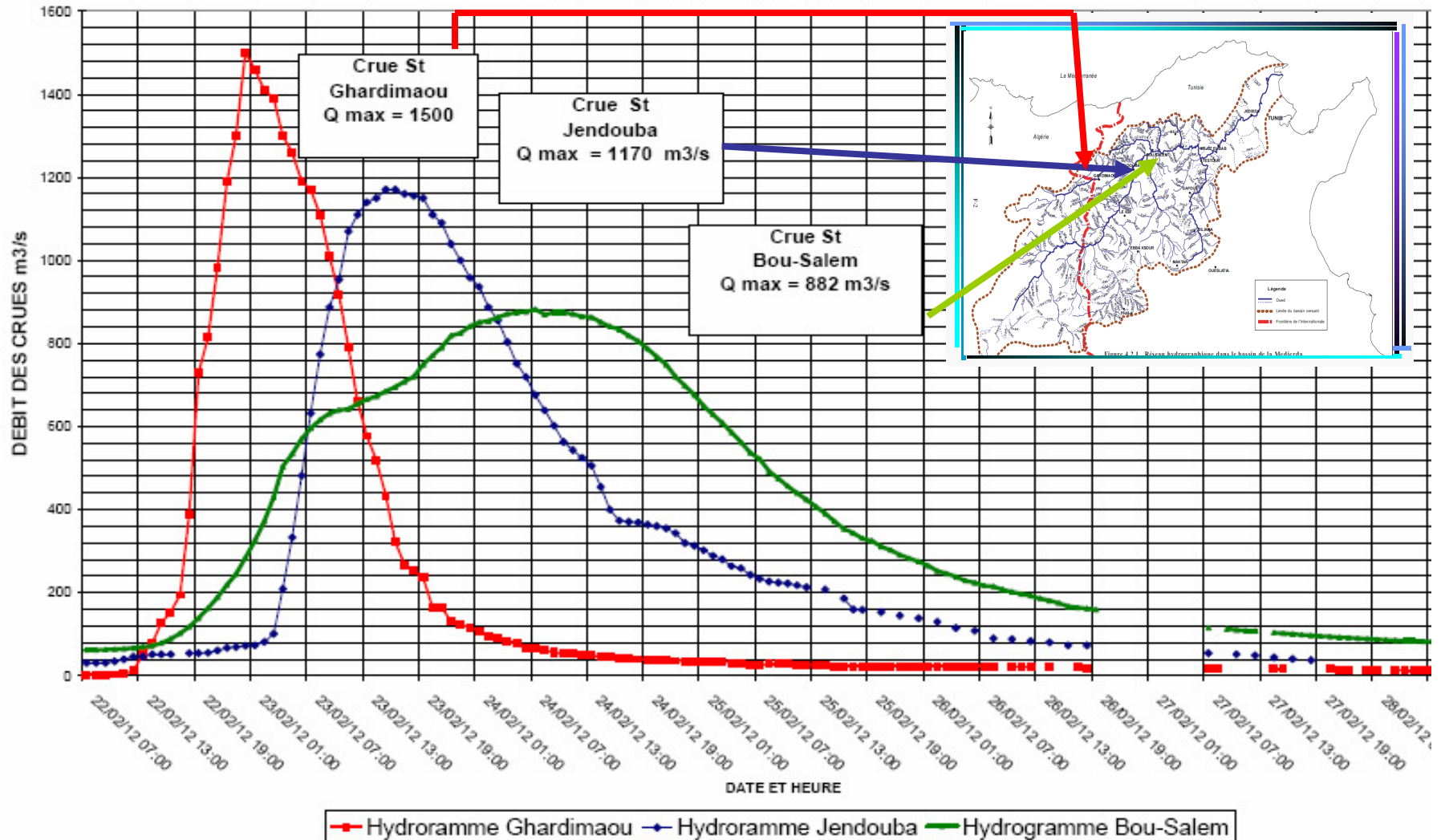
Rainfall Network 356 stations daily series; Study of the monthly-scale

in: Bargaoui Z, Trambly Y., Lawin E., Servat E. (2013) Seasonal precipitation variability in regional climate simulations over Northern basins of Tunisia. *Int. J. Climatol.*, in press

Hydrological monitoring and flood warning network SYCOHTRAC



MEDJERDA CRUE DU 22 AU 28 Février 2012



Inundations took place along the Medjerda bed in February 2012

Overall project goal

- To enhance the Medjerda flood warning system **SYCOHTRAC** of the hydrological division (DGRE) by providing numerical tools for flood forecasting.
- At the moment, it is based on a network of telemeter raingauge stations together with a network of telemeter limnimetric stations.
- Warnings are operated with respect to some **rainfall intensity and water levels thresholds**
- A previous work was performed by JICA (2009) in order to find out some regulation rules to mitigate flood impacts in BouSalem City.

Project purposes

- To improve the Medjerda river flood monitoring system,
- To develop the use of rainfall satellite information
- To implement a rainfall-runoff and flood routing models for runoff prediction and forecasting.
- To develop data, experiences and rules exchanges between Algeria and Tunisia water managers.

Individual outputs

- Extension of the river runoff monitoring system by installing six new gauging stations.
- Development of a daily and hourly rainfall database which will serve as reference to evaluate the performances of satellite data
- Integration of the geographical information systems available at the regional level into a unique system for the Medjerda watershed
- Development of exchanging protocols with Algeria

Other activities

- **capacity building program**
 - a) flood routing model such as HEC-RAS,
 - b) distributed rainfall runoff models;
 - c) SIG elaboration and flood inundation mapping ,
 - d) model adequacy measures,
 - e) water survey monitoring.
- **Development of the computer capacity of DGRE.**

Metrics to enable sound evaluation of the project

- **Relevance:** with respect to the **flood risk issues.**
- **Effectiveness:** **The project will be used by several water services**
 - DGRE, which operates at national level.
 - Regional services (CRDA)
 - Equipment services (DHU)
 - Emergency services (Civil protection)
 - PhD students may be involved in the project
- **Efficiency:** the success of the project is guaranteed by the state of development of **DGRE which honorably maintain a very interesting and unique data base of rainfall and runoff observed in Tunisia for more than a century.**
- **Impact :** **The project will impact the most active region of Tunisia** (economically speaking) as well as one of **the most populated.**
- **Sustainability:** With respect to the staff of DGRE which is composed partly of young engineers prompt to adapt to new technologies (satellite information, numerical modeling) as well as to the operational hydrological services at the regional scale (which will maintain the new gauging stations)

Collaborative framework

- **Key leaders** : DGRE and Université de Tunis El Manar.
- **Collaborators** : regional services (CRDA), national dam service, Equipment service of DHU, Agriculture representatives (water users), municipalities (population representatives).
- **Cooperation at the international level:** OSS; AMCOW; JAXA; ESA; NASA; University of Tokyo; JICA, IRD, ITC

A scenic view of a coastal area. In the foreground, there is a stone path leading through lush green vegetation. A low stone wall runs along the right side. In the middle ground, a large body of water stretches across the horizon. The sky is blue with scattered white clouds.

Thank you for your attention

Ghar El Melh
(Medjerda Mediterranean outlet)