



## Water Resources in the Lake Chad Basin, Assessment, Uses and Social Organizations

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Located at the sahel-desert boundary, the Lake Chad receives a 300 mm yearly rainfall for a 2200 mm evaporation. It is sensitive to changes in the West African Monsoon, which controls water input from its tributaries. The Lake Chad Basin (LCB) includes a series of superposed aquifers which contain mostly fossil water and were recharged during humid climatic periods. Assessment of the hydrological budget of LCB may help the agricultural and human development of the 4 African countries who share this basin (Niger, Nigeria, Chad, and Cameroon). As the Lake is located in a flat area, any change of its volume is associated to large change in its area and large displacements of its edges, with noticeable consequences for the different tribes of fisher, stockbreeders, and farmers who share these moving shores. In turn land surface changes induced by these populations introduce a feedback on water transfers in LCB. Hydrological studies and social studies must be therefore conducted simultaneously.

The LCB has been subjected recently to a renewed interest from the different French research agencies (IRD, ANR, INSU) which support a bundle of collaborating projects. These projects are focussed on the following topics:

- Hydrological modeling of the Lake Chad Basin
- Coupling between surface and underground water near rivers valleys and near the Lake
- Gravimetric detection of water resources from field and space data
- Aquifer properties and heterogeneities, their detection by geophysical methods and their consequences on water resources availability.
- Lake sediments and underground water isotopic composition as markers of climatic and /or anthropic changes.
- Consequences of agricultural development on underground water resources.
- Adaptation of farmers, fishers and stockbreeders to Lake Chad fluctuations and interaction between these different communities.

A short presentation of these different topics is given (with reference to more extensive talks and posters presented at the EGU). The interaction of the different projects involved in the different countries surrounding the Chad Lakes is emphasized.

Interaction with European scientists working in the same area or on similar approaches in semi-arid areas is sought to improve the scientific value of these programs and their impact for developing countries.