**Abstract**

Libya as many other regions under arid climates suffer from inadequate water resources to cover all the needs of this rapidly developing country. Increasing water amounts for population supply, agricultural irrigation and use for industry are needed. As groundwater is the main water source in the country it represents a natural resource of the highest economic and social importance. Conceptual and numerical models were implemented in a regional scale to show how the natural situation has been changed after heavy groundwater abstraction having occurred in the last decades in the northwestern part of Libya. Results of the numerical model indicated that the current zones of depression in piezometric surface could have been caused by smaller withdrawn amounts than previously estimated. Indicated differences in assessed withdrawn groundwater volumes seem to be quite high and might influence considerably the future possibilities of groundwater use in the study region.