



## **IWRM-concept for the Cuvelai Basin in Northern Namibia**

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Namibia is one of the most arid countries in Sub-Saharan Africa. In its northern central part, the Cuvelai Basin, a feasibility study was conducted for the implementation of Integrated Water Resources Management. The study focussed on the Namibian part of the basin, which is shared between Namibia and Angola, and its intra- and interbasinal linkages.

The investigated region is characterized by high population density, seasonal alterations of droughts and heavy rainfalls, mostly saline groundwater and a lack of permanent rivers. The difficult local conditions pose a great challenge for the water supply. Currently most of the drinking water of the area is withdrawn at the Angolian border from the neighbouring river Kunene and transported through a canal and pipeline scheme. However, it is supposed that this infrastructure will be put at risk: Increasing water demand in North-central Namibia due to its growing population and an extended domestic, agricultural and industrial water use is expected. Similar developments are assumed for the Angolan part of the basin. Additionally, climate changes could increase the variability of rainfall, which will also affect the water level of the Kunene and therefore raise uncertainties concerning the volume of available water. The lack of adequate wastewater disposal in the region is followed by further pollution of the few local water resources.

By integrating social-ecological as well as technical aspects, IWRM will open a chance to mitigate the problem dynamics. With focus on strengthening the use of endogenous resources alongside with demand-orientated management approaches (rational water use), aim is to establish alternative water sources (multi-resource mix). From the feasibility study the following technologies and their combination are considered as potential components of such a multi-resource mix: rainwater harvesting, decentralized solar desalination processes, artificial recharge of groundwater, use of wastewater as a source for the generation of energy, mineral nutrients and humus. Those technologies have to be adapted to the local situation, not only concerning the technological constraints but also concerning social and ecological factors, e.g. ecological consequences of using local water resources or the acceptance of the population, which poses probably the major challenge.

Implementation of technology must be integrated into the institutional and administrative processes of resource management as well as into the social, economic and ecological conditions of water use. Aim of this cross-sectional approach is to join efforts in water resource management, land management, and economic development. Thus, linkages to energy supply or small-scale farming as well as combating poverty and securing the means of population's livelihood have to be considered – in implementation of resource management schemes as well as in technological adaptations. The generation of income from agricultural activities on a small-scale, e.g. the production of goods for local markets, or generating alternative sources of energy to fire wood could be an important issue for developing regional economic potentials. For this reason, on the one hand securing natural resources is a prerequisite here; especially the resources of water and land. Multi resource mix represents a part of this security. On the other hand, it is crucial taking into account the intra- and interbasinal relations between Namibia and Angola.

The current upheaval in the Namibian institutional landscape and particularly the restructuring of the water sector makes this a particularly favourable time for a cooperative, further development of the Namibian IWRM.