

Location	Ziway Abiyata basin, Ethiopia
Contractor	Partners for Water
Partners	Meta Meta Communications BV, AG-Consultant Inc.
Period	2007

Scope of the project

The key problem in groundwater systems is that withdrawals exceed recharge and that the water yields are not safe. In fact, most aquifers are being mined. For the preparation of aquifer development, rescue and operation plans, it is necessary to have access to proper data. The goal of this project is to strengthen aquifer management in Ethiopia by building an innovative tool that allows stakeholders to interactively study the impact of ground water management actions using satellite based information on the hydrology of the ground water system.

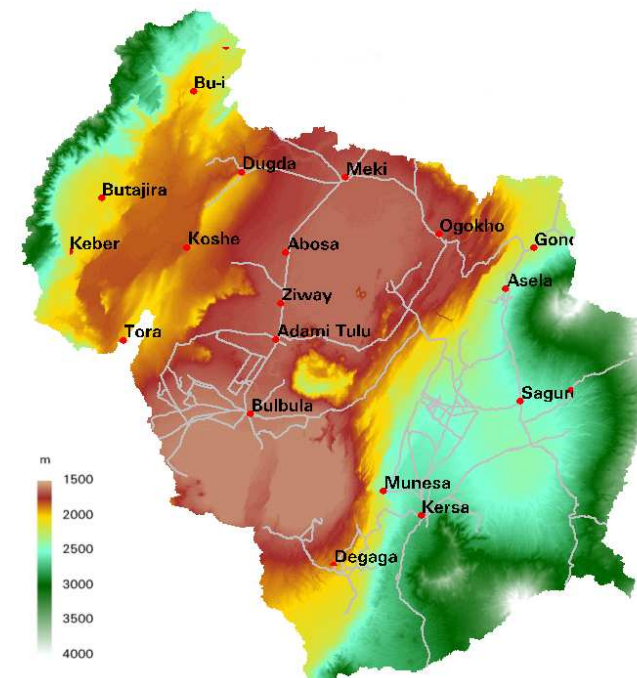
Study approach

The Ziway – Abiyata catchment is part of the Central Rift Valley system in Oromiya Province. The Ziway – Abiyata catchment is tectonically fragmented with shallow aquifer areas alternating with areas with deep groundwater. The interactive spatial planning tool GroundBuck developed helps in discussing ground water systems and their management options with a large group of stakeholders. GroundBuck utilizes satellite measurements as input data. Under the demonstration project first the water balance of the catchment area has been investigated using remotely sensed information on rainfall, actual evapotranspiration, soil moisture and vegetation cover. A time series between 1998 to 2005 has been investigated for inclusion of wet years (1998: 1057 mm/yr) and dry years (2005: 462 mm/yr).

Results

The computed river flows and lake level fluctuation were in agreement with the field measurements. It is concluded that the total catchment area (surface area of 1.03 million ha) contains a net storage of water across this period. Hence, it is safe to prepare water resources development plans.

The total catchment water consumption is 6198 million m³/yr. A large part of this water consumption is uncontrollable (70 %), as it concerns infiltration in soils and root water uptake by native vegetation. The 30 % consumable water resources in rivers, lakes and aquifers can be managed, along with the net storage that occurs from differences in rainfall and evapotranspiration.



Digital elevation model of the Ziway-Abiyata catchment

Conclusions

The Ethiopian case study has demonstrated a great interest in the product, mainly because the country is vast and the data for basing groundwater policy making upon is very thin. Moreover, many stakeholders in groundwater have opinions that are based on visions that are loosely defined and cannot be reproduced. There is a need for fresh visions and reliable data sets with creative solutions that are consistent and systematically. Remote sensing data fulfills that need, which was recognized from the first workshop onwards.

