# Land and Water Conditions for Assessing the Agricultural Potential in the Tana – Beles Growth Corridor

| Location | Tana and Beles basins, Ethiopia |
|---|---|
| Contractor | Euroconsult Mott MacDonald |
| Period | 2007 |

## Scope of the project

The Government of Ethiopia selected the adjoining Tana-Beles basins as the first growth corridor of the country. The abundant water resources in these basins used to develop and stimulate economic development. The condition, extent, and limitations of the resources need to be documented before a strategy for growth stimulation can be developed. This study presents an inventory of the natural resources in the area, and the physical planning of future irrigation systems.
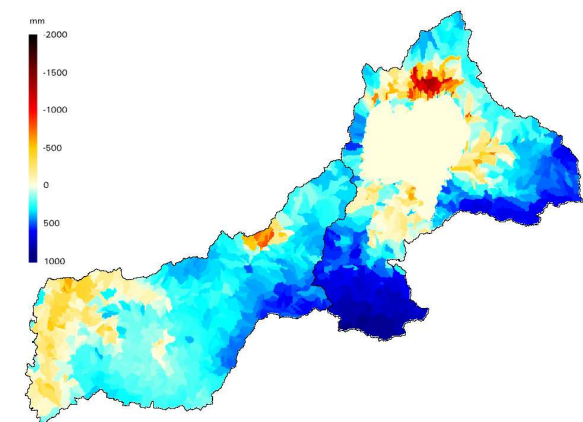
## Study approach

Agricultural production in the growth corridor can be promoted through: (1) the expansion of the area under rainfed agriculture; (2) the introduction of irrigated agriculture; and (3) conversion of ecosystems into irrigated land. Remote sensing provides information on rainfall, actual water consumption, biomass production, land cover, elevation and meteorological variability. The suitability of agricultural land depends among others on the water availability from rainfall and runoff, environmental constraints, slope, crop water requirements, irrigation efficiency, and the cropland climatic suitability. WaterWatch considered for a number of scenarios the water and land conditions and the impact on the basin hydrology. Scenarios included the expansion of the agricultural land, the construction of small-scale and large-scale irrigation infra-structure, and the effect of the tunnel that is currently constructed between Lake Tana and the Beles basin.

## Results

Abundant surface water resources are present and thus available to support the development in the Tana Beles growth corridor. In 70-80% of the total irrigable area no large-scale irrigation infrastructure is needed. Terrain slopes however area a limiting factor for both the sustainability of some rainfed agriculture and the development of irrigated agriculture. Approximately 75% of the irrigable land has slopes > 2%, which implies high tech irrigation systems. The introduction



*Runoff minus irrigation water requirements per catchment for current and expanded irrigated land. Negative values implies that large-scale irrigation infrastructure is needed*

of a tunnel withdrawing water from Lake Tana will seriously impact the water availability in the basin, and restrict the development of irrigation in the Tana basin to ~100,000 ha.

## Conclusions

There are sufficient renewable water resources (4.8 and 3.7 BCM/yr at 80% probability in the Tana and Beles basins respectively) for irrigation development. The establishment of a spatial database is the first requirement of any growth corridor study. Because of the limited data from the study area, satellite images must be exploited maximally for the establishment of the knowledge base. The Digital Elevation Model images, land cover images, rainfall images, ET images and biomass production images were crucial for making a first assessment of future directions for the Tana – Beles corridor.