TIGIST TADESSE
POST GRADUATE STUDENT
ADDISS ABABA UNIVERISTY
ENVIRNOMEN SCIENCE
DEPARTMENT

THESIS TITLE

WATER RESOURCE UTILIZATION AND RELATED ECONOMIC, SOCIAL AND ENVIROMNENTAL IMPACTS: LAKE ABIYATA AND SURROUNDINGS

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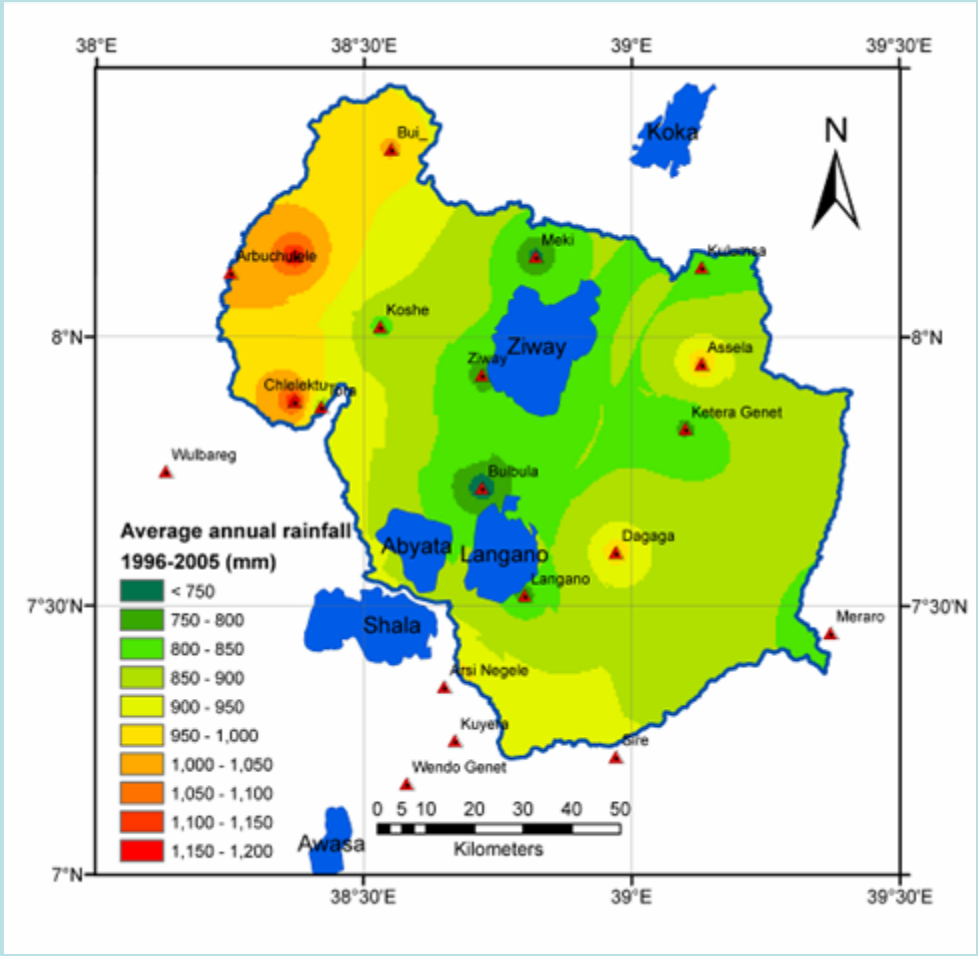
THE STUDY SITE

The central Rift Valley encompassing Lake Ziway, Lake Abiyata, Lake Langano and Lake Shalla which forms a complex and vulnerable hydrological system with unique ecological characteristics. The major rivers in this Ziway-Shalla sub basin are River Meki, Ketar, Bubula and Herakelo.


38°E
38°30'E
39°E
39°30'E
8°N
7°30'N
7°N
N
Koka
Bui
Meki
Kulumsa
Arbuchulele
Koshe
Ziway
Ziway
Assela
Chelelektu
Ketera Genet
Wulbareg
Bulbula
Average annual rainfall
1996-2005 (mm)
< 750
750 - 800
800 - 850
850 - 900
900 - 950
950 - 1,000
1,000 - 1,050
1,050 - 1,100
1,100 - 1,150
1,150 - 1,200
Abyata
Langano
Dagaga
Langano
Shala
Meraro
Arsi Negele
Kuyera
Sire
Wendo Genet
0 5 10 20 30 40 50
Kilometers
Awasa

WATER USE

- Irrigation
- Horticulture and floriculture enterprises
- Soda ash production
- Commercial fish farming
- Domestic water supply
- recreation

Competition for water resources is clear. Specially the direct water abstraction from Lake Abiyata for soda ash extraction, the development activities in the upstream area and excessive land degradation, deforestation is reducing the lake level and increased salinity and alkalinity of the Lake Abiyata showing high human intervention for the vulnerability of the area besides some contribution of climate change which indicate lack of water resource management in the area.

FALLING WATER TABLE: LAKE ABIYATA

GENERAL OBJECTIVE

The main objective of the thesis is to asses the impact of water use practices on the hydrology, environmental and socio-economic of the Ziway- Shalla sub basin so that appropriate measure will be taken in the future that will support a range of water resource utilization on a long – term sustainable basis.

SPECIFIC OBJECTIVES

- To quantify water abstractions for different activities in the up stream area of Lake Abiyata specially around Lake Ziway and to evaluate the extent of the water abstraction for soda ash production at the lake it self
- To asses water resource utilization practices in different sectors and how it's related with the lake change of Lake Abiyata in the base line year.
- To evaluate the socio-economic and environmental impact of the improper water resource utilization in the study area.
- To evaluate which activity is more significant for the lake level control, computing between rainfalls, supply and demand (water resource utilization).
- To evaluate different scenarios with regard to water sufficiency, integration between economic development objectives and environmental constraint will be evaluated.

METHODOLOGY

- Desk review of all available information, previous reports and studies on the project area.
- Consultation with relevant government departments and NGO’s
- Field visit to collect first hand data’s.
- Computer modeling techniques will be used.

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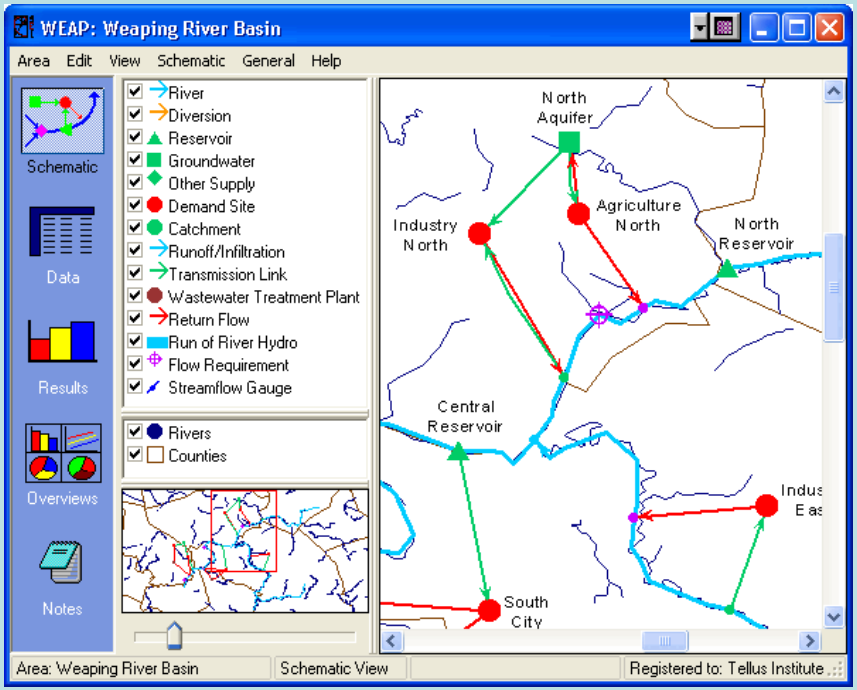
WEAP COMPUTER MODELING

Water evaluation and planning system (WEAP)

- It is distinguished by its integrated approach to simulating water systems and policy orientation.
- It provides a system for maintain water demand and supply information.
- As a forecasting tool, it simulates water demand, supply, flows and storage, pollution generation, treatment and discharge.



- It can address sectoral demand analyses, water conservation, water rights and allocation priorities, ground water and stream flow simulations reservoir operations, hydropower generation, pollution tracking, ecosystem requirements and project benefit-cost analysis.
- As a policy analysis tool, it evaluates a full range of water development and management options, and takes account of multiple and competing uses of water systems.
- WEAP scenario analysis can take in to account the requirements for aquatic ecosystems.
- Depending on the input data's which were feed to the software the resulting scenarios will be evaluated and forecasted how the management and climatic problems in the sub-basin area is affecting the lake level and environmental and other impacts on the area.

EXPECTED OUT PUTS

- From the research work it'll be possible to estimate water demand, supply, flow and storage of the abiyata and surrounding area.
- Sectoral demand analyses, allocation priorities, ecosystem requirements estimated.
- Future development scenarios analyzed that is answers for what if questions like; future population growth, economic development, efficient irrigation technique implementation, tightening of policy implementation and others will be considered and which will help as an input for other researchers on the area and for policy makers too.
- Clearly demand (utility) management effect on the water system will be indicated.
- Cause of hydrological changes investigated.
- Direct water abstraction from the lake by the soda ash factory and how it's affecting the aquatic ecosystem of the lake and impacting the socio- economic developments in the area like eco- tourism will be indicated.

- To recommend an appropriate measures that should be taken in the future to solve the problem of degradation of natural resources in the study area.
- Scenario's for future maintenance or rehabilitation of the lake level developed.
- Finally it will also indicates how the area didn’t balance between consumptive and non-consumptive uses in the sub basin which shows poor coordination, inadequate planning and lack of any guiding management or development strategies which recognize the vulnerability and inter dependence of the sub basin, so for the future this will help and address special foci to the lake basin management as whole and strengthen the implementation of policies which are not exercised in the sub basin previously.

THANK YOU