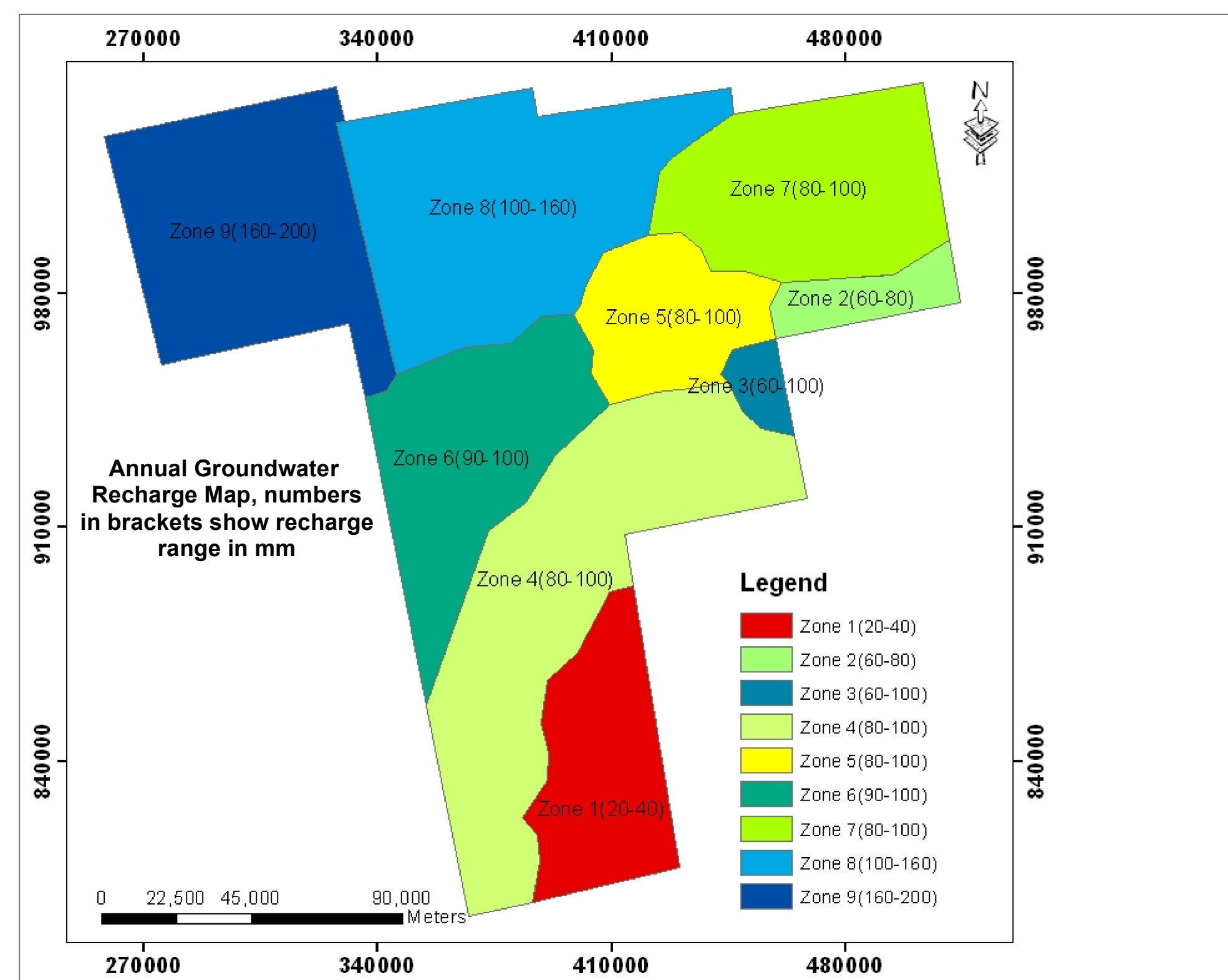
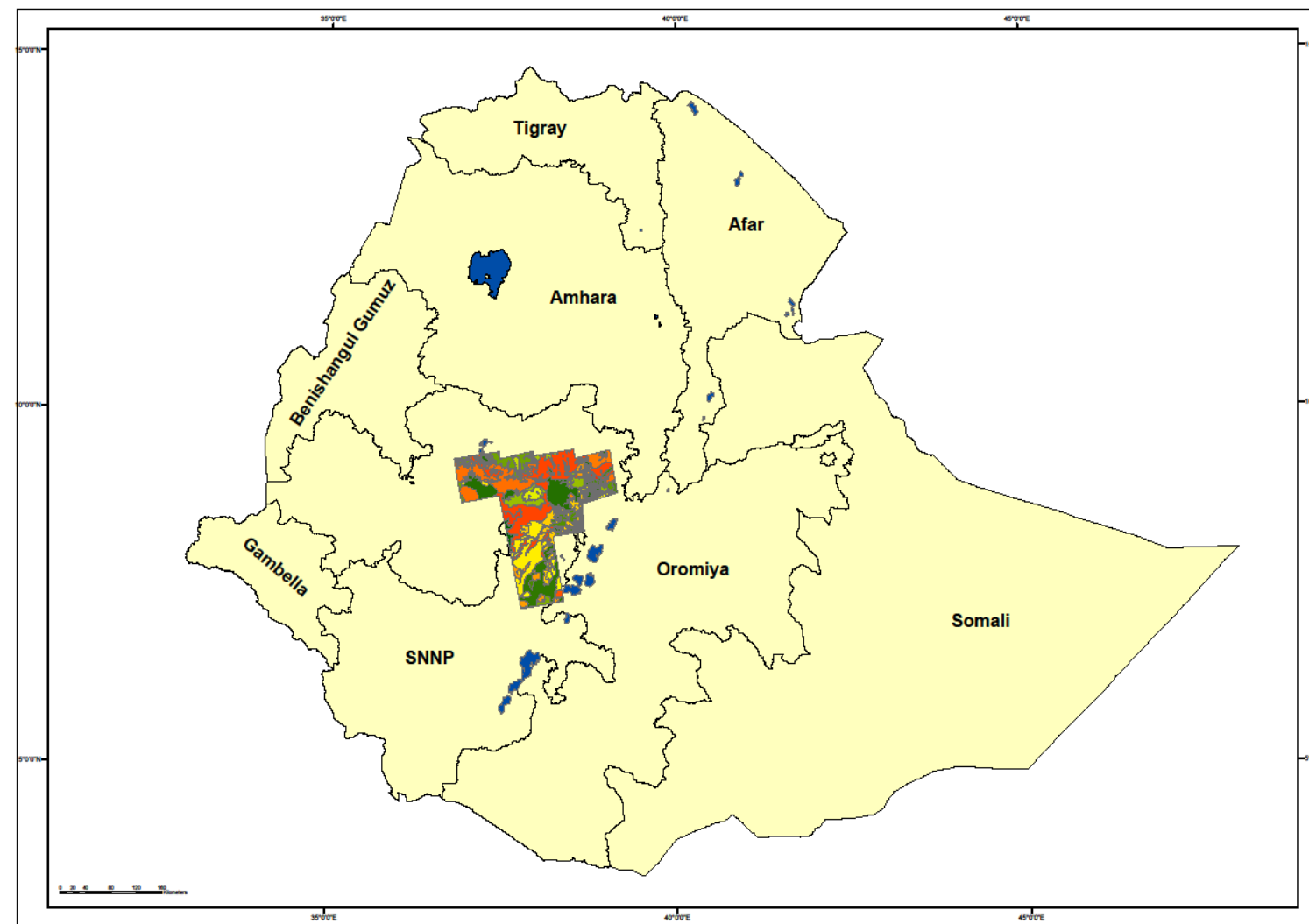
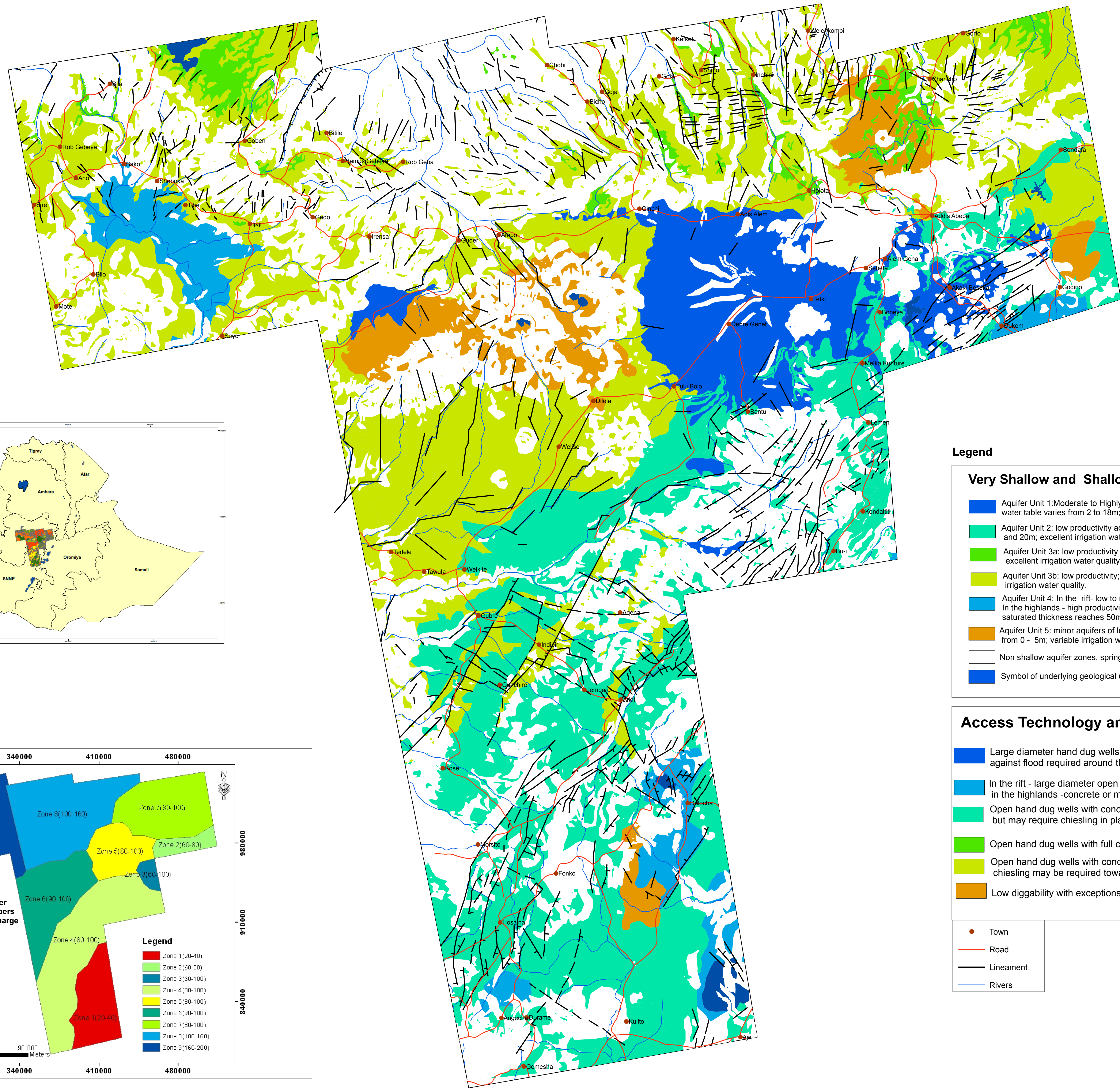
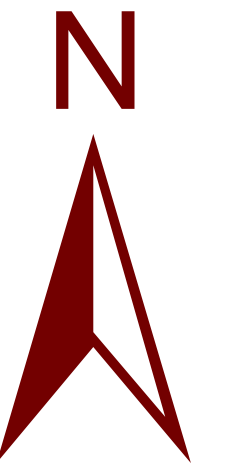


HYDROGEOLOGICAL MAP OF VERY SHALLOW AND SHALLOW GROUND WATERS IN CENTRAL ETHIOPIA



Legend

Very Shallow and Shallow Groundwater

- Aquifer Unit 1: Moderate to Highly productive aquifer with high storage and yield (> 0.5 l/s); aquifer thickness around 60m; depth to water table varies from 2 to 18m; yield increases towards rivers; seasonal water level fluctuation is 1 to 2m; excellent irrigation water quality
- Aquifer Unit 2: low productivity aquifers; yield varies between 0.01 and 0.05 l/s or less; depth to water table varies between 4 and 20m; excellent irrigation water quality.
- Aquifer Unit 3a: low productivity aquifers; yield between <0.01- 0.025 l/s; depth to water table varies between 0 - 3m; generally low permeability; excellent irrigation water quality.
- Aquifer Unit 3b: low productivity; yield is between 0.025 and 0.05 l/s; depth to water table varies between 4 and 10m; excellent irrigation water quality.
- Aquifer Unit 4: In the rift - low to moderate productivity aquifer; yield 0.05 - 0.1 l/s; high sodicity and salinity hamper use for irrigation. In the highlands - high productivity aquifer; yield > 0.25 l/s; permeability is relatively high; depth to water table is about 2 to 10m; saturated thickness reaches 50m; excellent irrigation water quality.
- Aquifer Unit 5: minor aquifers of low productivity and thickness; yield varies < 0.1l/s; depth to water table from 0 - 5m; variable irrigation water quality varying from moderate to excellent.
- Non shallow aquifer zones, springs could be locally source of minor irrigation given available spring and land.
- Symbol of underlying geological unit (Refer Geological Map of Central Ethiopia)

Access Technology and Diggability

- Large diameter hand dug wells with lining of the top 3m, manually drilled tube wells; lining is not required below 4m; protection against flood required around the well head; periodic dredging is required; easily diggable
- In the rift - large diameter open dug wells with no lining, manually drilled tube wells; periodic dredging is required; in the highlands - concrete or masonry lined large diameter dug wells; easily diggable
- Open hand dug wells with concrete or masonry lining of top 3m; no lining required below 3-4m; easily diggable but may require chiesling in places
- Open hand dug wells with full concrete or masonry lining; top part is easily diggable but may change to hard bedrock after about 10m
- Open hand dug wells with concrete or masonry lining of top 3m; no lining required below 3-4m; generally diggable but some chiesling may be required towards the bottom
- Low diggability with exceptions in places where ash intercalations are significant

- Town
- Road
- Lineament
- Rivers