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## Assessing the impact of existing and future water demand on economic and environmental aspects (case study from Rift Valley Lake Basin: Meki-Ziway Sub Basin), Ethiopia

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In the development of water resource projects, there is an increase and extensive use of water resources which cause exploitation of the existing systems and ecosystem of the natural environment. The water evaluation and planning (WEAP) model is used to assess water demand by considering the existing development situation and future water resources development with scenarios analysis in the study area (Ziway-Meki Sub Basin, Ethiopia). Three different development scenarios were developed to simulate water use at demand sites. In the simulations, the catchment was divided into 5 main sub-catchments where the supply and demand nodes were spatially located. The competing water sectors were irrigation development, domestic users, soda ash industry and environmental flow requirements. Hydro-meteorological data, net evaporation from Lake Reservoir, and monthly water demand from user sectors were the basic inputs to the model. The results of the reference scenario were validated using observed flows, and the simulation results revealed that the total average annual inflow volume into the study area declined significantly for reference scenarios; and water availability was limited in the month of January (17 Mm3) and December (171 Mm3). While in other months, the availability was efficient and all users had 100% coverage; except Langano irrigation site, which had between 33.33% to 86.5% coverage in average during the month of Feb to May (2.57 Mm3) and April in Bulbula 95.2% coverage. The minimum reliability observed mostly in the ongoing and likely future development scenarios at Bulbula irrigation demand sites which had 92.11% and 66.67% reliability in Langano irrigation demand sites throughout over all development scenarios, while in Sher-Ethiopia expansion, 51.75% reliability was observed in ongoing and likely future development scenarios and in demand site of Katar irrigation. Diversion and Meki irrigation from dam 51.75% was observed in likely future development scenarios.

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## Use of seismic refraction tomography to obtain the thickness and P-Wave velocity of the Weathered Zone in Oru, Imo State, Nigeria

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The Younger Granite rocks of the Jos Plateau and surrounding areas are richly mineralized with cassiterite. Consequently, a lot of mining activities have been carried out over the years in the area, many of which are carried out by trial and error means e.g. (Loto mining). In this study, some locations in the Jos-Bukuru complex were selected for field work which involved a reconnaissance geological survey and 2-D electrical resistivity survey. The strike of joints on rock outcrops revealed a dominant NE-SW trend and the petrographic study revealed dominance of biotite, quartz and feldspar in hand specimen and thin section. The measured apparent resistivity was iteratively subjected to inversion process using RES2DINV software, to generate the 2-D resistivity sections which revealed that the average depth to probable cassiterite bearing alluvium is least at Doi 2 (6 m) and most at Vom 1 (50 m). The average thickness of probable cassiterite bearing alluvium is least at Kwang Rayfield 2 (2 m) and greatest at Chongopyeng 1 (8 m). Suspected igneous intrusions and fractures were observed within the subsurface of Kwang Rayfield 1 and 2, Doi 1 and 2, Rapkparak Shen and Kwata Zawan 1 and 2 profiles. The 2-D resistivity sections for Vom 1 and 2 revealed probable depths to sub-basalt valley to be greater than 50 m and 45 m, respectively. Based on the findings of this study, it can be concluded that though large lodes of cassiterite may have been extracted, there may still be cassiterite deposits in the Naraguta area.

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