

# Potential Impact of Large Scale Abstraction on the Quality of Shallow Groundwater for Irrigation in the Keta Strip, Ghana

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## Abstract

The potential impact of large-scale groundwater abstraction on the shallow groundwater and crop production within the Keta Strip was examined. The assessment was based on geophysical data, data on groundwater quality, soils, irrigation water requirement and hydrogeology of the Strip. The results indicate that the shallow groundwater can support only medium to high salt tolerant crops. This is consistent with the medium salt tolerant crops especially shallot and onion currently grown in the area. Large-scale irrigation of the Strip will require at least  $2 \times 10^7$  m<sup>3</sup> of water during the dry season. Abstraction of such large volume of water from the shallow aquifer will result in the lowering of water table by approximately 1.0 m per year. The consequence of this will be the up coning of the fresh/saline water interface probably by as much as 4.7 m, resulting in salinisation of the fresh water lenses particularly around the lagoon end where most of the shallot farms are situated. Apart from up coning, salinisation may result from ingress of brackish/saline water from the lagoon and sea into the fresh water lenses. Though post irrigation rainfall will be adequate to nullify the water table depression, once the fresh water is contaminated, it is extremely difficult to decontaminate. Consequently, the shallow groundwater will evolve from medium through high to very high salinity hazard to crops. Specific ions toxicity will also increase due to increment in the concentrations of individual ions. Thus, the previously freshwater will become unsuitable for the production of even high salt tolerance crops. This will effectively halt the lucrative shallot and other vegetable farming in the Keta Strip and thus signify socio-economic disaster for the Keta Strip in particular and Ghana in general.