

SAWA PGD Fellow : RAJAREHA . S

Institution : CWR

Designation :

Title : *Studies of Surface and Subsurface Water Potential in Manimangalum Tank using Hydrological Model*

Email :

Water is essential for public health, food production, industry, energy production, communications, fisheries and ecosystems. It is a vast resource and a unique commodity in which everyone is a stakeholder. This resource has been depleting due to urbanisation. Excess abstraction of water for domestic, industrial and agricultural uses without any proper planning and priorities will adversely affect this resource. In this study, the surface water and groundwater potential in the Manimangalam village has been quantified. The study showed that surface water and ground water in study area is hydrologically connected and therefore, it should be managed simultaneously using an integrated management approach.

A hydrological modeling approach has been carried out for the estimation of surface water and ground water potential in Manimangalam village. A model is a simplified version of a real world system (both surface water and groundwater system) that simulates the relevant excitation response relation of the real – world system. HEC – HMS and MODFLOW softwares are used for the estimation of surface water and groundwater in the study area. Using HEC – HMS the available quantity of water present in the Manimangalam tank was estimated. Visual MODFLOW was used to determine the groundwater flow direction and the quantity of water potential in different zones using zone budget method.

This study also explores the socio-economic impacts of surface and groundwater potential in Manimangalam. These impacts were measured through the loss of income from occupation, crop production, and irrigation etc. Questionnaire surveys have been conducted in Manimangalam village with agriculturalists (farmers, land holders) and non- agriculturalists (people working in nearby industries). The responses obtained from this survey were analysed using Statistical Package for Social Sciences (SPSS). The results obtained from the model and SPSS are integrated in order to understand the impacts due to the changes in water potential in Manimangalam. The estimated average surface water potential and groundwater potential of Manimangalam village was found to be 17.623Mm³ and 14.27Mm³. The results obtained from the SPSS show that 64% of the respondents were using surface water and the rest of them were using both the surface and groundwater. The integration of three results obtained from the models shows that the surface water usage is more than the groundwater usage. This study benefits the agriculturalist and non agriculturalist by means of understanding the present situation existing in their village and through the Engineer can give possible technical solutions to manage the water resource.