

Abstract No: MP-14

GIS as a tool to find the suitable place for construction of water tanks in Karuwalabadda, Puttalam District, Sri Lanka

T. Vaigunthan, L. M. A. P Lansakara and V. P. A. Weerasinghe*

Department of Zoology and Environmental management, Faculty of Science,
University of Kelaniya, Sri Lanka

*primali@kln.ac.lk

The United Nations has long been addressing the global water crisis caused by insufficient water supply to satisfy basic human needs and growing demands on the world's water resources to meet human, commercial and agricultural needs. Although there are lots of water bodies in Sri Lanka some parts of the country suffer with a severe water crisis. Karuwalabadda is a Grama Niladari Division (GND) in Puttalam district in Sri Lanka which has 135 houses and more than 245 families and there are no any surface water bodies observed in the area. The most considerable problem in that area is the lack of drinking water due to longer period of drought except 4 -5 months. Many organizations and students from different universities tried to help them as short term solutions by distributing water in bowsers and bottles. There were several drawbacks of these solutions such as water distribution coverage is changing, water distribution does not occur throughout the day, higher fuel waste for water bowsers, there is no specific route for distribution of water and plastic bottles make environmental problem etc. Hence previous solutions are not sustainable, it is proposed to construct tanks permanently in different locations of the area. The suitable locations to construct water tanks were found out using ArcGIS software for the construction of tanks with minimum environmental impacts. From the GND map of Sri Lanka, Karuwalabadda study area was extracted and digitized with houses and main roads. Buffer was done 500m away from houses and 75m away from roads and then reclassified. Land use map of Karuwalabadda was converted from vector to raster. Surface water layer was not considered because there are no any surface water body in Karuwalabadda GND. Criteria for the suitable locations were bare land, 500 m away from houses and 75 m away from main roads. The final suitable area to construct water tanks map was prepared by assigning weightage to different thematic maps as 60% to land use map, 20% to houses and 20% to roads and then they were superimposed by weighted overlay tool. Final map was classified into 03 classes as suitable, moderately suitable and not suitable area. From suitable area 07 locations were selected to construct the water tanks. It was observed that constructing seven tanks of capacity 3000 L in the selected areas the water need of the whole village can be fulfilled. Proposed number of families for one tank can be approximately 22 families. Society based maintenance can be an effective way to maintain these tanks and by handing over these tanks to Preadeshiya Sabha water can be filled once a week. GIS technology is an effective and efficient tool for solving any location based environmental problems in the world and it has more potential to be used further to overcome many environmental challenges.

Keywords: Reclassify, weighted overlay, GIS, drinking water