GROUNDWATER RESOURCES FOR COMMUNITY WATER SUPPLY SCHEMES: A CASE STUDY FROM MINIPE – MUTTETTUTENNA IN THE KANDY DISTRICT OF SRI LANKA

A PROJECT REPORT PRESENTED BY
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ABSTRACT

As the dry season approaches and sluice gates of the irrigation canal system is closed, the dug wells in the Minipe area, which is located in the southern corner of Kandy District, gradually get dried up. The local people have to travel several kilometers to the nearest perennial dug wells and hand pump tube wells which are constructed down to the unconfined aquifer and fractured hard rock to satisfy their water requirement. This is very common to many parts of the rural areas in Sri Lanka. Hence, it is evident that both shallow and deep groundwater (the groundwater occurs at depth in rock) is the most reliable water sources in this area and therefore the development of these resources are necessary to meet the year round water demand of the people in the area.

In this project an attempt was made to identify some of the favourable and unfavourable factors that affect deep groundwater quality and extractable quantity and then to propose the correct way of selecting water sources for the drinking

purpose of rural community through water supply schemes. GIS and remote sensing techniques were used as the principal tool for overlaying performances.

Existing community managed water supply schemes of the area were evaluated and data tabulated as a summary. Collected hydrogelogical data were analysed and interpreted manually. The tables were prepared showing the distribution of electrical conductivity, fluoride, pH, hardness, total iron, calcium and total alkalinity of shallow unconfined aquifer and deep rock aquifers. The effects of the presence of surface water, fracture/fault and thickness of overburden and geology on water quality were analyzed manually.

Results revealed that the sustainability of a water supply scheme mainly depend on the yield and quality of the water source. Continuous monitoring of water level fluctuation, studying the recharge system of aquifers and community acceptance on water sources are very important and significant factors in selecting a water source for a community water supply scheme. The results also show that deep groundwater development potential close to the major structural zones (May be shear zones) are very high whereas areas away from these are of moderate to poor potential. It was found that in most of places, shallow unconfined aquifer (Safe yield 10 m^3/day – 30 m^3/day) can be used only for medium to small scale pipe borne water supply schemes covering 50 to 200 house holds with or without treatment and deep groundwater can be used for very large to small scale pipe borne water supply schemes covering around 50 to 2000 households with or without treatment. It was also found that the combination of shallow and deep ground water is the most reliable water source option for community managed pipe borne water supply schemes.