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**AQUIFER IDENTIFICATION, AND GROUNDWATER
DEVELOPMENT IN NUWARAELIYA BASIN**

A PROJECT REPORT PRESENTED BY

S.J.K. GAMAGE
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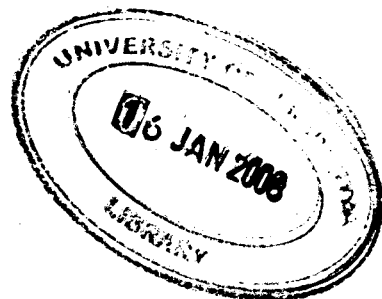
to the Board of Study in Earth Science of the
POSTGRADUATE INSTITUTE OF SCIENCE

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AQUIFER IDENTIFICATION AND GROUNDWATER DEVELOPMENT IN NUWARA-ELIYA BASIN.

S.J.K. Gamage

Water Resources Board

2A, Gregory's Avenue

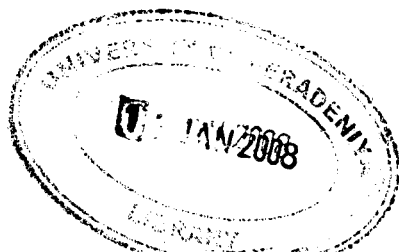
Colombo 07

Sri Lanka

Abstract

In most part of Sri Lanka surface water or shallow groundwater sources have sufficient quantity of water in rainy season and water scarcities during dry months. Therefore groundwater development is vital in these areas. In the case of Nuwara-Eliya, most serious problem for the city water supply system is surface water shortage occurring in dry season while the system has sufficient water in rainy season. As a remedial measure to this problem, groundwater usage for dry season has been proposed. For the purposes of groundwater extraction, aquifers of the area have to be identified. Further, ensuring the safe extraction in long run, recharge amounts should be estimated, in the relevant watersheds together with the water balance. Present study has been focused on these objectives.

Geology, structure and hydrogeology etc. of the area were studied in detail using available data as well as conducting field surveys. Geophysical investigations, mainly resistivity surveys were carried out through out the study area, to understand the sub surface conditions, the depth of the weathered and fractured areas as well as less potential areas of the basin. Considering the aquifer thickness & nature of aquifers, and also the recharge, suitable areas and watersheds were selected for further studies for groundwater extraction. Suitability of the areas was further confirmed by test drilling. Pump tests were done to examine the discharge and also to calculate aquifer characteristics. Two sub watersheds in the Nuwara-Eliya basin namely Upper Nanu Oya and Boburella (Hawa-Eliya) were selected for ground water extraction.



Four wells were constructed in the Upper Nanu Oya area to extract about 2850 m³/day of water and five wells were constructed in Hawa-Eliya to extract about 3200 m³/day. As far as groundwater potential of the two areas were concerned, groundwater extraction in Upper Nanu Oya and Hawa-Eliya are less than one third of the total potential of the groundwater of the respective water sheds. In general two types aquifers ie un confined and confined types are found in the area, but there are some connection from confined area to unconfined area through fractures developed in the confined area.

As shown in this study large amount of groundwater is possible to extract safely from such a high-elevated area in the highest peneplane of Sri Lanka. This is mainly because of the existence of relatively high permeable rocks such as crystalline limestones and calc gneisses with high percentage of calcite (over 50%). As far as the water quality is concerned, ion concentration in the groundwater is very low due to regular flushing off of aquifers because of high rainfall and topographic relief.