

Sustainable Use of Fresh Groundwater Lens of Pleistocene Aquifer in Nam Dinh, Vietnam

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Abstract : The fresh groundwater lens of the Pleistocene aquifer in Nam Dinh was formed since 12,900 years ago. Currently, the Pleistocene aquifer has been continuously exploited on average of 154,163m³/day, distributed mainly in the districts of Nghia Hung, Hai Hau, a part of Truc Ninh, Y Yen, Nam Truc and Giao Thuy. The groundwater level is still on a declining trend, saltwater intrusion in this freshwater lens can occur if the growth rate in exploitation is maintained. This study focused on groundwater sustainable use by means of 4 groups of criteria including: Groundwater quality and pollution; Aquifers' productivity and capacity; Environment impacts due to exploitation (groundwater level decline, land subsidence due to water exploitation); Social and economic impacts. Using a combination of methods including field surveys, geophysics, hydrogeochemistry, isotope and numerical models to determine safe groundwater exploitation thresholds for the whole study area has been determined to be 544,314m³/day and the actual exploitation amount is currently about 30% compared to the safe exploitation threshold. However, it should also be noted that the current groundwater exploitation threshold and level of its exploitation compared to the safe exploitation threshold of each locality are not the same. From this result, the groundwater exploitation threshold map of the study area was established to serve the management, licensing and orientation of groundwater exploitation.

Keywords : criteria, groundwater, fresh groundwater lens, pleistocene, Nam Dinh

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