Recharge of deep aquifer in Kelantan, Malaysia

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The Kelantan Coastal Alluvial plain has a thickness varying from a few metres in the interior to over 200 m near the coast. It consists of several layers of sand/gravel and clay. Generally the alluvium can be regarded to consist of two aquifers; the top shallow aquifer and the lower deep aquifer. However, due to hydraulic connection between the two, the whole alluvial sediments can be regarded as one groundwater system. The general flow pattern of the system is north to northeast. The hydraulic conductivities of the aquifers range between 50 to 250 m/day. Recharge to the top aquifer occurs directly from rainfall, particularly during the northeast monsoon season. The effective recharge to the top aquifer normally takes place a few hours after the beginning of the rain. The fast response of the top aquifer is mainly due to the unconfined condition of the aquifer. Initial tritium study of water in the aquifer shows that the water from the top aquifer has high tritium count and this indicates that it is a fairly young water. The tritium content of the groundwater is similar to the average tritium content of the rain in the area. However, the water from the main Kelantan River also shows similar tritium content. There is a possibility that the river water may be partly responsible for the recharge of the top aquifer.

The lower aquifer which has a vast reservoir of groundwater, generally, has a lower tritium content - an indication of older water than the water of the top aquifer. The hydraulic conductivities of the lower aquifer are generally higher than those of the top aquifer. This means that the flow velocity of the lower groundwater is faster or at least equal to that of the upper aquifer.

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