

IAH network on “Coastal aquifer dynamics and coastal zone management” QUESTIONNAIRE

IAH national committees, IAH members and non members from all around the world involved in SWI and SGD research and management are kindly asked to fill in the questionnaire

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| 1) | Location of aquifer (country, more specific location): | Byunsan-myon, Buan-gun, on the western coastal area of Byunsan peninsular, which is about 210 km from Seoul, capital of Korea |
| 2) | Reported by: | Sung-Ho Song, Jin-Yong Lee, Namsik Park |
| 3) | Type of medium (karst, porous, fracture) | Porous |
| 4) | Type of aquifer (phreatic or confined) | Phreatic |
| 5) | Main lithology - (e.g. gravel, sand and clay) | The hydrogeological sequence is: colluvial deposit or reclamation soil, a weathered zone, and bedrock |
| 6) | Hydrochemistry: fresh or saline | fresh |
| 7) | Saltwater intrusion: lateral from sea or lakes - upconing | |
| 8) | Aquifer geometry: hydraulic characteristics | hydraulic conductivity of the reclamation layer ranged from $1.31 \cdot 10^{-5}$ to $2.18 \cdot 10^{-5}$ cm/s and that of the weathered layer ranged between $1.06 \cdot 10^{-3}$ and $9.85 \cdot 10^{-3}$ cm/s. The hydraulic conductivity of the upper portion of the bedrock is in the order of 10–5 cm/s. TDS was very much varying between 327 and 6,946 mg/l and it was closely correlated with EC. The EC of groundwater varied from 456 to 11,590 μ S/cm, equivalent to the resistivity ranges of 0.9–21.9 Ω -m. |
| 9) | Aquifer parameters: storage - annual water pumping - (in MCMA - millions cubic meters, annually) | |
| 10) | Depth of aquifer (water level and bottom) - water level 5- 30 m - aquifer depth - 50-200 m | Water levels in the study area occurred at depths of 0.20–3.19 m below ground surface, which corresponded to –0.81 to 6.25 m above mean sea level. Annual fluctuation of the water levels was within 1 m. |
| 11) | Major chemistry (anions - ?; Cations - ?): | Na ⁺ , Cl ⁻ , HCO ₃ ⁻ and Ca ²⁺ |
| 12) | Major salinity sources: | |
| 13) | Population: | |
| 14) | Aquifer status: special features - e.g. thermal springs, major faults,... | |
| 15) | Investigation methods - e.g. water level measurements, EC (electrical conductivity profiles), TDEM (geophysical), | Fifteen shallow wells are installed to make pumping and slug tests. To delineate the zone of seawater intrusion, VES (vertical electrical sounding) surveys were performed at 30 points. Resistivity profiling was also constructed along two traverses to analyze the profile of seawater wedge. Chemical analysis of groundwaters are conducted to establish: pH, EC and TDS, cations, anions. |
| 16) | Numerical hydrological modeling, chemical and isotopic methods, age determination, IR survey, seepage meters (for Submarine Groundwater Discharge, SGD) | To examine spatial distribution of resistivity values with depth, a kriging method was used. And a variogram analysis was also conducted. |
| 17) | Monitoring methods applied and duration - water level measurements, EC (electrical conductivity profiles - seasonal) | |
| 18) | Management methods: | Network of wells |
| 19) | Aquifer management actions: | |
| 20) | Identification of existing or potential problems: | Seawater intrusion |
| 21) | Annexes: | Groundwater chemistry and ionic ratios in a western coastal aquifer of Buan, Korea: Implication for seawater intrusion (Jin-Yong Lee, Sung-Ho Song). Evaluation of seawater intrusion on the groundwater data obtained from the monitoring network in Korea (Jin-Yong Lee, Myeong-Jae Yi, Sung-Ho Song, Gyu-Sang Lee) |
| 22) | Observations: | VESs were conducted to delineate seawater intrusion in this site. These results indicated the existence of the highly conductive layer between the upper and bottom layers, which was confirmed by the drill logging data. |