

Mercredi 29 novembre 2006 à 11h00

Salle de conférence de la Maison des Sciences de l'Eau
300, avenue Dr E. Jeanbrau à Montpellier

Ground water resource and its management in Delhi, India (séminaire en anglais)

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Résumé : National capital territory Delhi has been experiencing increasing pressure to meet demand for its water resources. The population of Delhi is expected to cross 18 million by the end of 2008. The city, at the moment, requires 3,324 million liters of water a day (MLD) while what it gets stands closer to 2,034 MLD. Average water consumption in Delhi is estimated at being 240 liters per capita per day (lpcd), the highest in the country. The large-scale extraction of ground water is a result of this widening gap between the demand and supply of water. Serious doubts are also being raised about both the quality and quantity of ground water. The Union Territory of Delhi consists of flat and level plains interrupted by cluster of sand dunes and a long continuous chain of rocky ridges. The sand dunes are of varying dimensions and in general trend northeast - southwest. The crests of the dunes generally lie between 6 and 15 meters above the surrounding plains. They are more or less fixed in this area and support vegetation. It appears that they are of longitudinal type and are oriented parallel to the prevailing wind directions. The National Capital Territory of Delhi is part of the Indo-Gangetic alluvial plains. The river Yamuna, a tributary of the Ganga, flows through the Eastern part of the territory, and a Quartzitic Ridge, rising between 5m up to 91 m above the surrounding plains acts as a groundwater divide between the western and eastern parts of Delhi. The alluvial formations overlying the quartzitic bedrock have different nature on either side of the ridge. The nearly closed Chattarpur alluvial basin covering an areas of about 48 Km² is occupied by alluvium derived from the adjacent quartzite ridge. Yamuna flood plains contain a distinct river deposit. Alluvial plains on eastern and western sides of the ridge are characterized by the occurrence of older alluviums. The average annual rainfall in the region is 611 mm, most of which falls during the monsoon season between July and August. The total renewable resources have been estimated by the Central Ground Water Board (1996) around 290 Million m³ / year. Investigations on the natural recharge in the NCT Delhi shows that levels of recharge is lower than 5% in most of the area. In the urban centre, recharge was lower than 3%. The Yamuna river flowing in a southerly direction in the eastern part of the Union Territory of Delhi is the only perennial river in the area. Surface Water contribute 86% of Delhi total water supply, namely the Yamuna River, which equals 4.6% of this resource through interstate agreements and the Subsurface water (Ranney wells and tubewells.) which is met through rainfall (approx. 611.8 mm in 27 rainy days), and unutilized rainwater runoff, is 193 MCM (million cubic meters) and lastly by graduated resources which is estimated at 292 MCM, however current withdrawal equals 312 MCM. Salinity and over exploitation has contributed to depletion and drastically effected the availability of water in different parts of the city. However, according to a report released by the Central Ground Water Board (GCWB), Delhi's ground-water level has gone down by about eight meters in the last 20 years at the rate of about a foot a year. The ground water table is Delhi has depleted to 20 –30 meters in various areas across the city. Compared to a level of 30 – 40 feet at the time of Independence, the water table has dropped to 350 feet at certain places. It is said to be falling at 10 feet per year on an average. Ground water levels have depleted by 2 – 6m in few blocks to 10ms - 20 ms in other block.

The quality of underground water is also deteriorating and in several places it has been found to be unfit for human consumption. Our study has pointed out that the quality of water has been deteriorated in selected locations especially near to land fill sites. The polluted stretch of Yamuna river in Delhi is found to contribute to the deterioration of the ground water quality in the region. All these aspects will be discussed by me in this lecture.

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