Monitoring of surface and ground water quality in Peshawar Basin

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Peshawar Basin covering an area of about 5500 km^2 is situated at southern margin of the Himalayas between the longitude 71^0 $15^/$ and 72^0 $45^/$ E and Latitude 33^0 $45^/$ and 34^0 $30^/$ N. Major cities of the basin include Peshawar, mardan, Charsadda and Nowshera It is surrounded by Khyber piedmont ranges in the North East and Attock Cherat ranges in the south and bounded by Indus River in the South West. Physiographical units consist of piedmont plain in the south west part ,flood plain between the Kabul and Swat river, loess plain in the central part of the plain and four important rivers i.e. Kabul river, Bara river. On the basis of varying lithologis, the quaternary sediments, covered soils and hosting aquifers of the Peshawar basin are classified as Peshawar piedmont, Peshawar flood plain and Peshawar lacustrine sediments, soils and aquifers.

The present study is focused on the monitoring of physical and chemical characteristic of surface and ground water quality during 2003 and 2004. The results of the study were compared with the previous findings. Physical parameters such as pH, temperature, Electrical conductivity, total solids, and the anions such as Sulphates (SO4), Bicarbonates (HCO^3) and Chlorides (Cl) were determined in both surface and ground waters. The cations which were determined included calcium (Ca), Magnesium (Mg), dium (Na) and Potassium (K). The concentration of these constituents in waters is essential for life and health of all the organisms but their existence beyond the maximum permissible limit may result in toxicity of hosting organism. The findings of the study were compared with the international standards set by Environmental Protection agency and world health organization (WHO)

Fifty three water samples were collected from deep aquifers, i.e. (tube wells), forty two from shallow waters, i.e. from dug wells and nineteen from surface waters. (River, streams and springs) from Peshawar piedmont, Peshawar flood plains and lacustrine aquifers of the basin. The results of the study revealed that aquifers of the Peshawar basin are generally categorized as alkaline earth fresh waters but in some areas small input of alkaline fresh water has also been noticed. Among the physical parameters, pH of the waters of Peshawar basin varies from acidic (pH 4.5) to alkaline (pH 10.1) while the EC and TdS are generally within the permissible limits with elevation in certain areas of the basin. In most parts of the basin both surface and ground waters have Cations and Anions within permissible limits but certain areas have higher concentrations of the these constituents which could be considered hazardous. The deterioration of the water quality in Peshawar basin may be attributed to percolation of these waters through the lime stone, dolomite, gypsum and seams of Sulfides, salts and coal within the quaternary sediments. The anthropogenic sources may include the untreated domestic, industrial and agricultural waster making its way into the waters of the basin