

## **Post Flood Drinking Water quality Assessment of Charsadda District Using GIT's**

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Flooding is a regular event in the areas of Khyber Pakhtunkhwa settled along the banks of River Kabul. The Northern parts of Pakistan remained victim of heavy summer monsoon rains from 22 July 2010 to 27<sup>th</sup> August 2010. In 2010, monsoon system showed a drastic shift and resulted in heavy rainfalls that caused mega floods in Kabul River. This research focused on analyzing water quality after flood disaster in the densely populated district Charsadda. An integrated Remote sensing and GIS study proves to be an essential tool to evaluate and quantify the impacts of land use / land cover on ground water quality. Spatial distribution maps of various pollution parameters were used to demarcate locational distribution of water pollutants in a comprehensive manner. The process of pollution risk assessment requires assimilation of data that were spatially variable in nature, making geographical information systems (GIS) an ideal tool for such assessments. Raster and vector-based data were used within a GIS framework to produce maps indicating areas of potential hazard to water quality and coupled with existing models to predict and quantify risk frequency and impact.

Water samples were collected from the wells of flooded area in Charsadda, lab tests were performed and water quality parameters were checked against World Health Organization (WHO) standards. Water Quality Index was calculated and Department of Environment (DOE) classification was done showing the water quality. Water Quality Index calculated for the chemical and biological parameters revealed that after flood rating of pH, TSS and chlorides have been deteriorated where as TDS, alkalinity and sodium shows an improve condition. Other parameters such as conductivity, hardness, sulphates, potassium, nitrite, Total plate count and Coliform bacteria shows the same quality of water. After DOE classification the water is classified showing almost the same quality rating as in WQI except sulphate quality was deteriorated and chlorides remain in the same class. If the water quality of Charsadda was compared with the WHO standards then according to TSS, conductivity, total plate count and Coliform bacteria its unfit for drinking. The major contamination in the water was found through the biological parameters which shows a very high value and should be considered for further human consumption.

GeoEye-1 imagery was used to detect flood inundated area. Samples were overlaid on imagery to identify and classify water affected area. Finally maps were drawn to show the water quality and flood effected area in Charsadda district.