

Modeling of water contamination in Hamadan city, west Iran

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This study is an approach to evaluate the increase in urban sprawl in Hamadan, west Iran in 2015 and its related impacts on drinking water quality. Water samples were collected systematic from 45 locations during arid season tow areas Ramadan. Area (A): Industrial and urban areas and areas (B): Areas non-industrial and away from the city. The physico-chemical and microbial characteristics were estimated as per the standard analyzing procedures and attributed to the geocoded sampling locations. The result showed TDS ranges from 295 to 535 ppm in the area (B) and 418 to 605 in the area (A). With respect to the recommended permissible limits 5 sample from the area (B) and 12 samples from the area (A) were observed to be above the desirable limit. The DO ranges from 4.561 to 5.980 mg/L in area (A) and 4.35 to 6.83 mg/L in area (B), whereas 8 samples were found to be beyond the recommended permissible limit. The BOD of the water samples ranges from 0.352 to 2.773 mg/L in area (A) and 0.52 to 2.96 mg/L in area (B). All the samples were within the standard limits. Also, the Sulphate concentration calculated from 28.50 to 485.35 mg/L in area (B) and 30.24 to 504 mg/L in area (A). The nitrate concentration calculated between 5.33 and 75.15 mg/L in area (A), whereas in area (B) the range of nitrate is between 4.45 and 58.11 mg/L. As well the Fluorine concentration was between 0 to 1.05 mg/L in area (A) and 0.105 to 0.91 mg/L in area (B). With respect to the recommended standard almost all the samples less than the standard limit. The results showed the pH of the water samples rates from 6.9 to 8.3 in both areas. The EC rate was in areas (A) and (B) ranges from 546 to 2280 and 485 to 1815 $\mu\text{S}/\text{cm}$ respectively, that the numbers of 15 samples were less than the drinking standard limit. The Cl⁻ was of ranges from 17.7 to 230 mg/L and from 22 to 227.5 mg/L in areas (A) and (B) respectively, while all the samples were within the recommended permissible limits. The TH ranges from 215 to 870 mg/L in area (A) and 188 to 764 in area (B). The results showed that most of concentration ions in industrial and urban areas were outside the standard range.