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Quality of Kani-Ban water as a main tributary of Tanjero River for irrigation purposes

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Abstract

The current study was undertaken to evaluate the suitability of Kani-Ban stream water as one of the main tributary of Tanjero River in Sulaimani for irrigation purpose. Water samples were collected from (6) various locations from November (2013) to April (2014). Water samples were analyzed the various physico-chemical parameters, such as, pH, Electrical Conductivity (EC), Total dissolved solids (TDS), Na⁺, K⁺, Ca²⁺, Mg²⁺, HCO₃⁻, CO₃²⁻, SO₄²⁻, Cl⁻, B, and NO₃⁻. The present work is a trial to evaluate and classify the water quality of Kani-Ban stream for irrigation purpose, by using the model of Irrigation water quality index (IWQI) developed in Brazil. The results obtained on (IWQI) for all sampling sites were within the class of use with no restrictions (excellent) for irrigation.

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Introduction

According to Shalhevet & Kamburov (1976) [1] irrigation water quality is mainly defined by the total quantity of dissolved salts and its ionic composition depending on the water source, location and time of water sampling. Although Water Quality Index (WQI) is usually orientated to qualify urban water supply, it has been widely used by environmental planning decision makers. The quality of the irrigation water has to be evaluated to avoid or, at least, to minimize impacts on agriculture [2]. The chemical constituents of irrigation water can affect plant growth directly through toxicity or deficiency, or indirectly by altering plant availability of nutrients [3] and [4]. The quality of water reflects inputs from the atmosphere, soil, water rock, weathering and pollutant sources. Its use for irrigation depends upon the dissolved salts like Na, Ca, Mg and HCO₃ in water. The concentration of these salts and their ratio to one another are influence the quality of water for irrigation [5]. Water used for irrigation can also vary greatly in quality depending upon the type and quantity of dissolved salts. In irrigated agriculture, the hazard of saline water is a constant threat. Poor-quality irrigation water becomes more concern as the climate changes from humid to arid conditions. Salts are originated from dissolution or weathering of rocks and soil, including dissolution of lime, gypsum and other slowly dissolved soil minerals. These substances are carried with the water to wherever it is used [6] and [7].

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Materials and Methods

A. Study area

Kani-Ban stream has been selected for the present investigation. This stream is fed by the sub-cathments in Bakrajo district (Figure: 1). Kani-Ban stream represents one of the two main tributaries of Tanjero River located south of Bakrajo by 3km and collects water from valleys and springs in Tasluja area around Baba-Ali bridge passing through Kani-Ban valley. Width of the stream ranges between 3m and 5m and the water depth grades from 0.3 m to 1 m.

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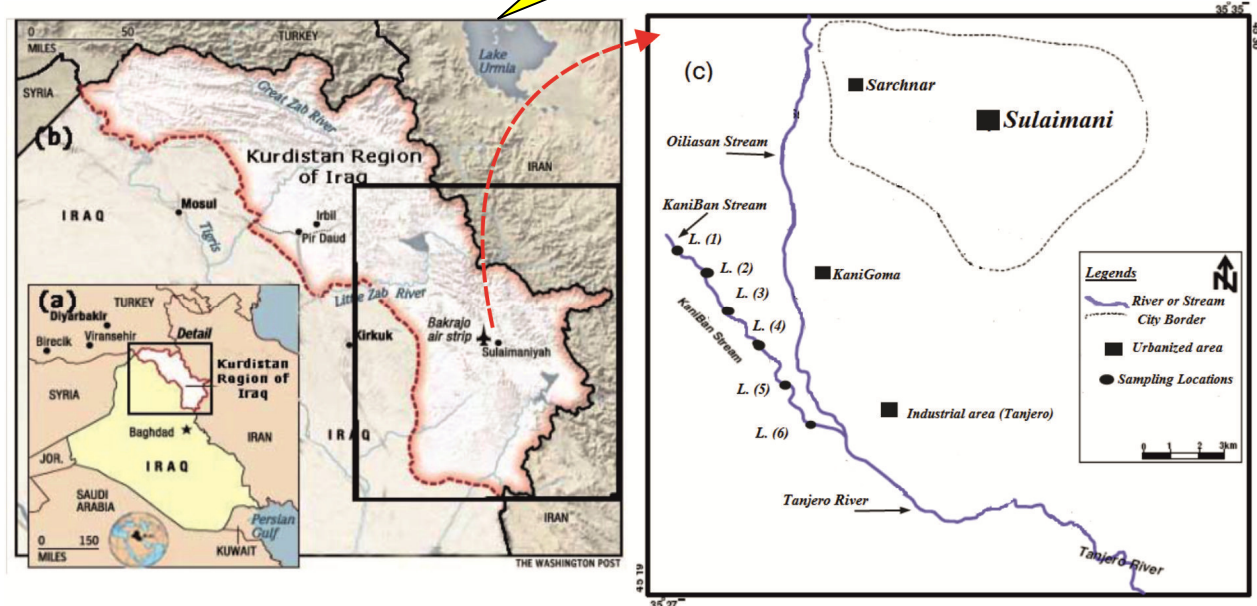


Figure-1: Map of the studied area showing; (a) Map of Iraq, (b) Map of Sulaimani City, (c) Sampling sites along the Kani-Ban stream.

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Table-1: Geographical coordinates along with the elevations of the sites from which samples were taken

Locations	(UTM) Geographical coordinates		Elevation (m)
	X	Y	
1	38531107E	3931361N	705 m
2	38531426E	3931290N	699 m
3	38531871E	3931065N	700 m
4	38532422E	3930693N	703 m
5	38532699E	3930235N	703 m
6	38533115E	3930180N	710 m

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References

- [1] APA style
- [2] APA style
- [3] APA style

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