



ESTIMATION OF THE QUALITY INDICATORS IN THE IRRIGATED SOIL WITH INDUSTRIAL WASTEWATER IN ALMARAWEA'AH- HOUDIDAH - REPUBLIC OF YEMEN

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ABSTRACT

In a comprehensive study, soil surface (0-60cm) and subsurface (60-120cm) samples, (industrial- wastewater and wells water samples beside of plant samples (forest and wild shrubs) were collected from Almarawea'ah area, Al-houdiadah governorate. The objective of the study was to evaluate the environmental impact of wastewater that flow from food factory. The water is used for irrigating a silty loam soil and plants grown thereon which were evergreen trees (wind breaks) since 25 and 5 years ago (the first and second stages, respectively). Also, the analysis of chemical, physical, biological and microbial indicators was done. Obtained results showed that soil salinity was increased three times but sodium adsorption was increased 10 times as a result of using wastewater for irrigating the evergreen trees since 15 years ago where the EC and SAR were 0.115mS/cm and 1.3, respectively in the non-treated soil as compared with the treated one which were 0.37 mS/cm and 12.5 for EC and SAR, respectively. There was

no significant impact for soil depth 0-60 and 60-120cm as well as for years of applications (5 and 25 years) on all the evaluated properties. However, organic matter, nitrogen, phosphorus, and iron contents in treated soil were slightly increased with no significant differences. On the contrary, potassium and manganese were significantly increased at 0.05 level as compared to non-treated one.

Regarding to the plant analysis the obtained data showed that no significant differences between the concentration of the studied elements (N, P, K, Fe, and Mn) in leaves of trees (their local names are Muraimerah and Damas) and shrubs (Thomam and Abad). However, zinc concentration was high in shrub plants (2350.5 ppm) compared to trees (103.5 ppm) which indicated that shrub plants can collect high levels of zinc (zinc hyper-accumulator plant).

For water, comparison of samples collected from ground water wells (near and far) and wastewater samples collected morning and evening, the results indicated that using factory wastewater for irrigating trees to be used as wind breaks was suitable way to prevent expected environmental contamination and transmission of those contaminants to the ground water

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