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MULTIVARIATE ANALYSIS OF WASTEWATER QUALITY OF DIFFERENT RURAL HUMAN SETTLEMENTS IN PUNJAB (INDIA)

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Abstract

An attempt has been made in the present study to investigate the wastewater characteristics from six different rural human settlements in the state of Punjab, India. The six selected rural catchments are located on a radius of about 5-50 kilometers from Phagwara town, Kapurthala district. The study area comprises the villages of the districts of Jalandhar, Kapurthala and Shaheed Bhagat Singh Nagar in Central Punjab. The wastewater samples were collected between January, 2012 and July, 2012 and analyzed for BOD₅, COD, TSS, TDS, Nitrates, pH, TKN, Alkalinity, Total P, Coliforms, heavy metals (Cd, Ni, Pb, Cr, Cu, Zn, Fe, Mn and As) and elements (B, Ca, Mg, S and K). The study revealed that the village ponds are the only disposal point where the major portion of the wastewater generated from rural micro watersheds is being disposed. TSS, COD, Nitrates and Coliforms were found to be major pollutants in the wastewaters of rural micro watersheds (all exceeded the surface water quality standards developed by Central Pollution Control Board, India). BOD₅ and Ammoniacal nitrogen (NH₃-N) were found to be exceeding these standards occasionally. Investigations also revealed a very low ratio of BOD₅ to COD for the rural wastewaters which indicated that the contribution of cattle wastewater is significant in the wastewater originating from rural catchments. Principal component analysis was applied to identify linkages between the individual pollutant parameters generated from the rural micro watersheds.

Key words: low cost wastewater treatment, micro watershed, principal component analysis, wastewater characterisation

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