STATISTICAL ANALYSIS OF WATER QUALITY PARAMETERS OF DOMESTIC WASTEWATER IN THE CITY OF SRINAGAR, JAMMU AND KASHMIR, INDIA - A CASE STUDY

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Abstract. In the present study, physico-chemical characteristics of domestic wastewater such as dissolved oxygen content, biological oxygen demand, conductivity, total dissolved solids, turbidity, pH, alkalinity, iron content, chloride content, hardness and nitrate content were determined for the sewage samples obtained from the sewers across different locations in Srinagar city of Jammu and Kashmir, India. The study was carried out in three different seasons of the year which were the seasons of pre-monsoon, monsoon and post monsoon. The obtained results were analyzed to determine the need of sewage treatment plant in city. Statistical Methods were also used to find variability of each wastewater parameter across the city. Extensive correlation analyses reveal that there is a relationship between variables which shows that one variable causes changes in another variable.

Keywords: water quality parameters. correlation coefficient. domestic wastewater. physicochemical analysis. sewage treatment plant

1 Introduction

Contamination or pollution, in its widest sagacity, includes all variations which restrain natural helpfulness and exert harmful consequence on life. The calamity prompted by the industrialization and very fast-mounting populace and with the subsequent dilapidation of the surroundings causes a severe risk to the feature of life Deterioration of quality of water is the hostile modification of the properties of water (chemical, physical and biological) that averts domestic, industrial, commercial, recreational, farming and additional advantageous uses of water.

Water resource growth has taken place throughout the world. There is a remarkable extent of burden in shielding and protecting the water assets obtainable in the country [1]. Shielding the superficial water assets from domestic wastewater contamination plays a noteworthy role for the improvisation and development [2-3]. The disposal of domestic wastewater into the surface water body leads to serious health problems that affect the common people [4]. Especially, in the urban areas, the domestic wastewater discharges into the nearby rivers or lake, this is ultimately creating many problems to the public [5]. Wastewater is a main reason for deterioration of water bodies [6, 10] and inappropriate dumping of sewage leads to reduced demand of oxygen, amplified concentration of nutrients and elevation of deadly algal blooms that leads to a weakened aquatic ecology [7-8]. Regular watch of the bases of potable water and water quality is very important as it directly affects human health [9].

Several studies involved application of modern tools and techniques to detect changes in construction practices [11-12], predict changes in water qualities due to sustained pollution [13-16]. Deterioration in water quality has also affected ground water [12, 17].

The aim of present paper is to ascertain the quality of domestic wastewater in Srinagar city in and effect of monsoon on the quality of domestic waste-water. Various tests on the samples collected from the different locations in premonsoon, monsoon and post monsoon season were conducted in the government laboratory under PHE at HMT. After the tests, it was found that the domestic waste-water in Srinagar is contaminated and immediate measures need to be taken to safeguard the local population from water borne diseases.

2 Methodology

Present study was accomplished in the capital city of Indian union territory of Jammu and Kashmir, Srinagar. A total of fifteen samples were collected from five diverse sampling locations across the city in three different seasons viz., season before monsoon, monsoon and after monsoon of year 2018. Standard sampling procedure was followed during the collection of samples and all the samples were instantly transported to laboratory for testing.