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A Review of Assessment of Physical and Chemical Parameters of Present Water Quality of Kunda River at Khargone (M.P.)

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ABSTRACT –

The Kunda river is situated at Khargone district of Madhya Pradesh state. A study was considered for the development of water quality index using seven parameters such as Turbidity (NTU), Temperature (°C), TDS (mg/L), Alkalinity (mg/L), Hardness, Chloride BOD (mg L^{-1}) and DO (mg L^{-1}). With the growth of people and industries, water is considered a major need. With the increase in population and industrialization, the demand for fresh water has increased over the past decades. This need is met by rivers that provide water for human life and agricultural purposes. Due to the waste released from human and industrial activities, the water quality of the river has decreased which affects human life and aquatic life.

Keywords- Kunda River, Physical and Chemical Parameters, Water Quality Indices.

1. INTRODUCTION

Surface water quality control policy, in general, should keep existing pollution limits below certain levels and ensure minimum dissolved oxygen concentrations for aquatic life. The primary pollutant parameters to be considered in surface water quality control, in general, include water. Dissolved oxygen reveals the changes that occur in the parameters of organisms due to aerobic or anaerobic activity and indicates the condition of river/stream water for the purpose of aquatic life and human life (Chang, 2005). Aquatic life is disturbed due to low values of DO. Domestic and industrial wastes in surface and ground water pollute the water quality which can be assessed by BOD determination.

2. LITERATURE REVIEW

Water quality index includes different physical, chemical and biological parameters to determine water quality indicators using various statistical measures (Yogendra and Puttaiah, 2008). The use of the WQI was originally proposed by Horton (1965) and Brown et al.(1970). Since then, many different methods of calculating WQIs have been developed. The process of calculating the WQI was different that was proposed by the scientist (Zagatto et al., 1998; Stambuk Giljanovic, 1999).

The different water quality index used around the world are US National Sanitation Foundation Water Quality Index (NSFWQI), Canadian Council of Ministers of the Environment Water Quality Index (CCMEWQI), British Columbia Water Quality Index(BCWQI), Oregon Water Quality Index (OWQI) , Weighted Arithmetic Water Quality Index (WAWQI) (Abbasi, 2002; Kannel et al., 2007; Lumb et al., 2006; Sharifi, 1990). Generally two steps are required in the calculation of water quality indicators. First is the conversion of selected water quality parameters into minimum reference values. The second is the integration of these values into a water quality index value. Various studies on water quality indicators were reported in the literature by many researchers (Stambuk Giljanovic, 1999; Miller et al., 1986; Ott, 1978; Hallock, 2002; Pesce and Wunderlin, 2000; Brown et al., 1970; Bordalo et al., 1970; Bordalo et al., 1970; al., 2001; Cude, 2001a,b; Liou et al., 2004; El-Gafy et al., 2005; Sinha and Saxena, 2006; Boyacioglu, 2006; Gomez et al., 2007 ; Fulazzaky, Tyagit9; al., 2013). Many countries around the world use these water quality index criteria to assess the quality of water resources, such as the United States (Canter, 1996),

United Kingdom (House, 1989), Canada (CCME, 2001), India (Tiwari and Mishra, 1985).), Egypt (Amman, 1995), Argentina (Almeida et al., 2012), Brazil (Coletti et al., 2010), Spain (Sanchez et al., 2007), Iran (Nikoo et al., 2011) and Malawi (Wanda et al., 2012). Bhargava (1983a,b,c) introduced the concept of water quality index in India and gave an index scale from 0 to 100 for highly polluted to unpolluted water. Studies on water quality in various Indian rivers have been conducted and the results have been analyzed for human consumption (Bhargava et al., 1998; CPCB, 2000;

Upadhyay et al., 2010). Little work has been reported on the quality of the Narmada River (the largest west-flowing river of Peninsular India).

3. WATER QUALITY STANDARDS

Water quality means statements and numerical values that describe water quality and fall into the following three components:

1. Designated uses of a water body related to water supply, aquatic life, agriculture, or recreation.
2. Water quality standards and general statements that describe good water quality and specific numerical concentrations for various parameters.
3. Anti-degradation policy to maintain and protect existing water uses for each water body.

The quality used for particular water is a function of the expected use of the water. This means that the established standards used for drinking water are only used in determining the drinking water quality index, while the Aquatic Water Quality Index standards are used for the protection of aquatic life. Basically, the index can be calculated for three different uses:

1. An index of drinking water quality that includes drinking, recreational, irrigation, and livestock water use.
2. Aquatic Water Quality Index that includes conservation and utilization of aquatic life.
3. An overall water quality index that includes protection of human health, aquatic ecosystems and wildlife.

4. WATER QUALITY INDICATORS

To determine the quality of a water body, the chemical, biological and physical conditions of the water body must be measured. Chemical measurements, biological surveys, and visual observations (physical) provide the "big picture" of what is happening in a body of water. The following is a list of indicators (physical, chemical and biological) that are often measured to assess water quality.

4.1 PHYSICAL PARAMETERS

1. Turbidity (NTU)
2. Temperature (°C)

4.2 CHEMICAL PARAMETERS

1. TDS (mg/L)
2. Alkalinity (mg/L)
3. Hardness
4. Chloride
5. BOD (mg L^{-1})
6. DO (mg L^{-1})

5. WATER QUALITY AT DIFFERENT LOCATIONS

S1 - WATER TREATMENT PLANT
S2- ONDAL RIVER
S3- CANAL AT SHRI SIDDHI AVENUE
S4- GANDHIGRAM EXTENSION COLONY
S5- RAHIMPURA
S6- TANDI MOHALLA (BADA BRIDGE)
S7- SEWAGE TREATMENT PLANT

6. CONCLUSIONS

The water is absolutely not suitable for drinking without any kind of treatment, but for other purposes of surface water use, it can still be considered quite acceptable. But as we know, once a dirty habit starts, it usually quickly causes a serious breakdown. So a few years from now, a major deterioration in water quality is likely. However, there may be significant differences in the test results of some samples in different laboratories in the

country, which may limit the use of these data for critical policy issues. Differences may be due to the method used by the laboratories in the preservation of the sample, the quality of the chemicals used, the test method used or the qualification or expertise of the technicians or testers.

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