IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

WATER QUALITY ASSESSMENT-A LITERATURE SURVEY

TWO DECADES JOURNEY

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Abstract :The scarcity of water is increasing to a great extent due to population explosion,intenseindustrialization andurbanization. Various scientists worked on the water quality assessment of industrial waste water,river water and other water resources.This paper highlighted researchers work in the said field emphasizing these two decades i.e.20 years from 2004 to 2023 andincludedthe literature survey related to research exertion on water bodies in vicinity of mining areas andand various pollution causing industries. The physio chemical analysis by various co-workers helped the society to understand the quality of water and its utility and potability and its significance in forthcoming years.

Index terms- Industrial waste water, mining area, potability, water quality assessment.

I. INTRODUCTION

On Earth, 96.5% of the planet's water is found in seas and oceans, 1.7 % in ground water 1.7 % in glaciersand the ice caps ofAntarctica and Greenland, a small fraction in other large water bodies, and 0.001% in the air as vapor, clouds (formed of solid and liquid water particles suspended in air), and precipitation. Only 2.5% of the Earth's water is freshwater, and 98.8% of that water is in ice and groundwater. Less than 0.3% of all freshwater is in rivers, lakes, and the atmosphere, and an even smaller amount of the Earth's freshwater (0.003%) is contained within biological bodies and manufactured products**[1]**. Surface, Subsurface and atmospheric water, in all its forms, is collectively called as hydrosphere**[2]**. The self-purification of water is facilitated by the antagonism of microorganisms in a water body, the action of direct sun radiation, and dilution of the water with pure water from non-polluted sources**[3].** It serves as an important resource providing freshwater for above mentioned purposes during the period of drought and scarcity. The groundwater water sources used by people for drinking and domestic purposes could become worse and unsuitable for any purpose if rate of contamination and negligence remain the same in coming years. The demand for water for various uses is increasing day by day while the availability of useful water is practically remaining constant. This necessitates the proper development and management of available water resources, which in turn, requires long term studies of site/location. As per IS:1172-1993. In industrial cities, the per capita water requirement may be around 450 l/person/day as compared to the normal industrial requirement of 50 l/person/day. A figure of 10 l/head/day is required for public utility purposes **[4-8]**.

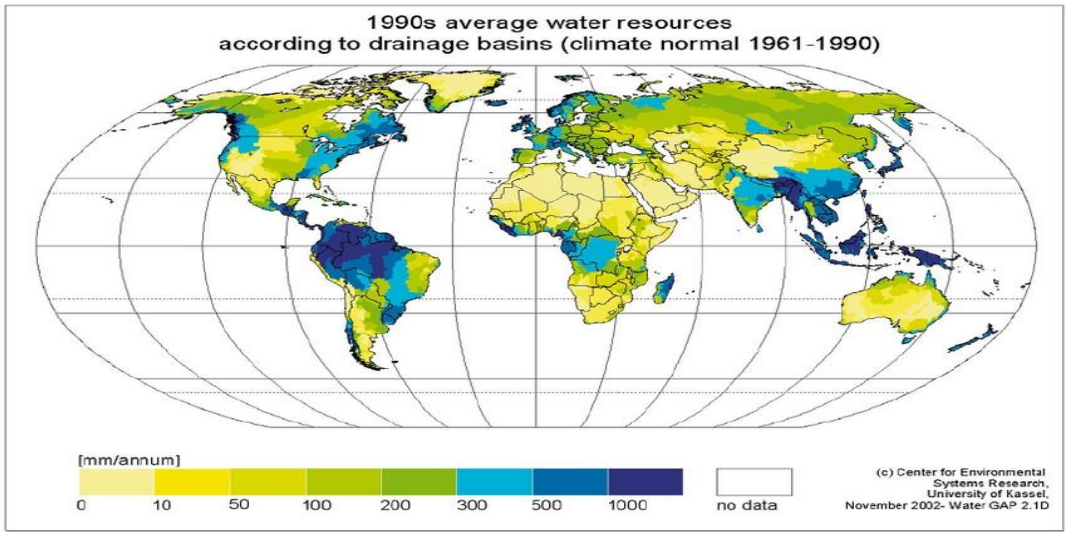

Fig.1.Average water resources(1961-1990)

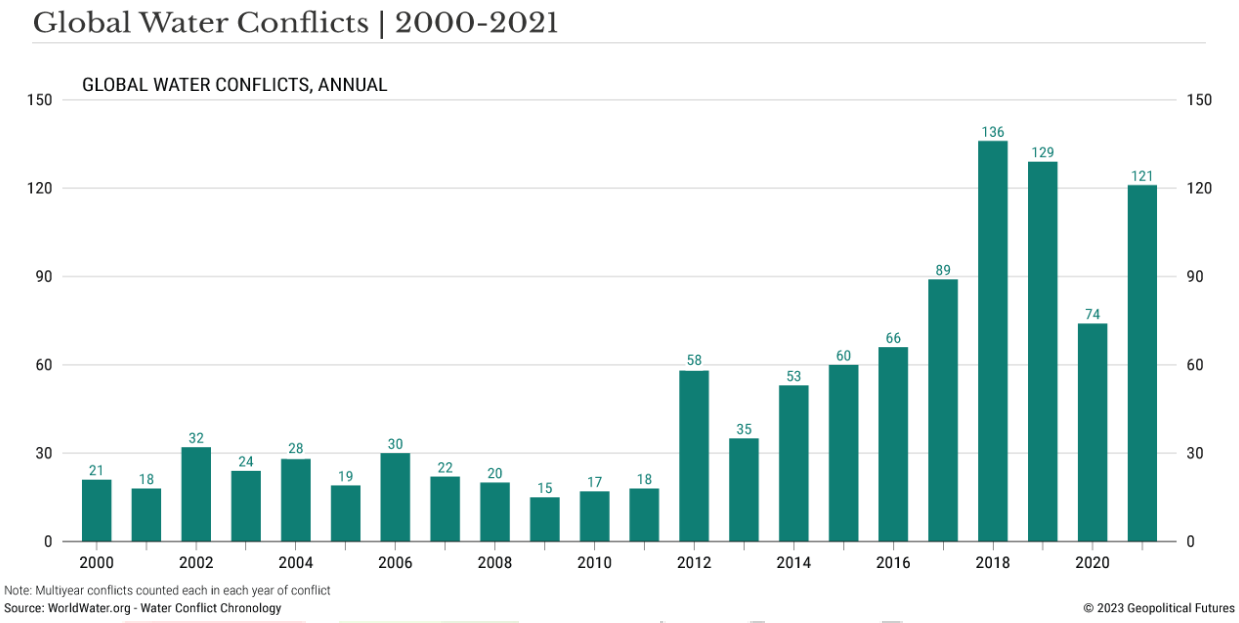

Fig.2.Annual Global water conflicts(2000-2021)

The OECD Environmental Outlook predicts that by 2030, about 47 per cent of the world's population will be living under severe water stress - approximately 3.9 billion people. Increasingly, the world is recognizing the importance of good quality water for environmental flows and the value of water as an ecosystem service. Ecosystem services are the benefits we gain from the environment through the provision of freshwater, food, timber, climate regulation, erosion control, and pharmaceutical ingredients. Adequate supplies of water are vital to support many of these services. Water shortages are a serious problem for water dependent industries; the most obvious example being agricultural production which declines during a drought Understandably, water is allocated to people first and industry's needs come last. In addition, the cost of water is rising as a result of water scarcity and as new infrastructure is built. Water is often needed to generate energy and energy is used to supply and manage water **[9].**

II. LITERATURE SURVEY

Numerous workers in our country have attempted studies on water quality of various water bodies. Yang et.al. (2023)calculated the water quality index to analyse the spatial and temporal characteristics of water quality in the study areaand the effect of water diversion and they also developed the minimum water quality index model which is quick and inexpensive way to assess water quality**[10].**Luvhimbi et.al (2022) evaluated the physico -chemicla and bacteriological quality of drinking water supplied by Municipality from source to point of use at Thulamela municipality,Limpopo province ,southAfrica where levels of E.coli and total coliform detected during wet season were higher .Also trace metals level indrinking water

sample were within permissible range of both South African standards and WHO organization.Hygienic practices of transportation and storage of drinking water from source were suggested**[11].**Tambekar et. al. (2012)carried out water quality assessment of Chandrapur city for drinking purpose**[12].** Dash et. al. (2010) studied the effect of Durga idol immersion on some water quality parameters of Bramhani river at Rorkela in Orissa**[13].**Jambrik et.al. studied the original and secondary effects on ground water quality by mining in the East Borsod Coal Basin, Hungary. They found that in all almost all Hungarian coal basins, intensive dewatering lowers the hydrostatic pressure of aquifers, reduce their water resources, unbalance water management of the area**[14].** Muthulakshmi et. al. (2010)evaluated the seasonal variation of Physico-chemical parameters using correlation of Physico-chemical parameters using correlation and regression analysis. The study included the parameters like pH, total hardness, chloride, sulfate, sulfite, total dissolved solids, bicarbonate, carbonate, COD, BOD calcium, magnesium, sodium, potassium and total alkalinity**[15].**

Pattnayak et. al. (2010) determined the inorganic anions i.e. Chloride, fluoride, nitrate, sulphate, sulphide and phosphate in drinking water collected from different sources of Balsore town planning area in Orissa. The concentration of these ions was within permissible limits**[16].** Raja Manickam et. al. (2010)studied the effect of textile dyeing industries effluent on groundwater quality in Karur town. The samples were collected during monsoon, premonsoon and post monsoon season and analysed for total hardness, TDS, alkalinity, Calcium, chlorides and sulphates whose results indicated pollution load in river remedial measures like artificial recharge of aquifer by spreading of surface water was suggested in river basin and adjoining areas**[17]**. Dash et. al. (2010)carried out correlation and regression study of some physico-chemical parameters of groundwater of Sanganer town in Rajasthan. The parameters taken into account were pH, electrical conductivity, COD, total hardness, alkalinity, chloride, fluoride, phosphate, sodium, potassium nitrate, cadmium, lead and iron, which would be helping in determining the control and monitoring of water quality**[18]**.Saranya et. al. (2010)done the hydro chemical studies and evaluation of surface water quality along Buckingham canal of Chennai city which included the analysis of pH, TDS, sodium, potassium, calcium, magnesium, chloride, sulphate, carbonate, bicarbonate and nitrate. All the parameters were within BIS limit except sulphates **[19]** .Tambekar et. al. (2012) analyzed the effect of open defecation practices on chemical and bacteriological quality of water in open defecation free (ODF) and open defecation not free (ODNF) village in Amravati district and detected source of contamination by antibiotic resistant analysis**[20].**Junshum et. al. (2004) studied the water quality at the Mae Moh Power Plant, Lampang Province. They conducted the monitoring of water quality from six reservoirs around Mae Moh thermal power plant were conducted during January – December 2003. There was a statistical significantly differences for values of electrical conductivity, total dissolved solid, hardness, silica, arsenic and lead between natural water sources**[21].**

Qian et. al. made surface water quality evaluation using multivariate methods and a new water quality index in the Indian River lagoon, Florida. Their objective was to study the water quality using several multivariate techniques**[22].** Anu et. al. carried out the comparison of physic-chemical parameters of various water bodies in and around Bhopal**[23]**.Nisha et. al.studied the groundwater pollution in Kanjikode industrial belt and its impact on the cattle health. Bhulal et. al. carried out the impact of solid waste contamination in upper and lower lakes of Bhopal**[24].**

III CONCLUSION

All around the world water scarcity is becoming a serious problem as most of freshwater bodies are dying and groundwater level had reduced to an alarming extent. Huge number ofresearchers, Researchscholars ,Scientists worked in this sensitive area and concluded that water resources have been continuously pollutedand the solutions are yet inside research papers or published articles but no practical usage is done so far.In India where population is on high peak and available water stocks and other capacities are going down, anurgent need of water quality assessmentprogramme is demanded where in all water sources and natural resources willbe conserved and assessed for satisfying generations needs.

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