



सप्रेम श्रद्धा  
येथून प्रवेश करण्यास सक्त मनाई आहे

# BRIEF REVIEW OF LITERATURE

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The whole world is covered about 71% of water surface. Even though the scarcity of water in the world is major problem for human being. In various countries numbers of Institutions are working for various facets of water. The Institution like American Public Health Association (APHA), AWWA, World Health Organization (WHO) and Australian Water Watch has been come in existence and working on global level. In India, Indian Water Work Association (IWWA), Central Pollution Control Board (CPCB) is working since from last several years.

For the conservation and proper maintenance of freshwater number of times several programmes have been organised. The first United Nation Conference was organized in 1977 at Mar del Plata, Argentina, similarly Global Consultation on Safe Water and Sanitation was held in New Delhi. The International Conference of Water and Environment was held in 1992 at Dublin. UN Commission of Sustainable Development (5<sup>th</sup> session) for Assessment of Global Freshwater Resources in 1997 etc. These events show the water conservation and maintenance is global issue which is being exploited on international level also.

The Ministry of Environment and Forest (MOEF) has been created by Government of India in the year 1981 to look in to the environmental aspects of air, water and soil. National Lake Conservation Programme (NLCP) and National River Conservation Programme (NRCP) have been launched under the overall control of National River Conservation Directorate (NRCD). In India, the National Water Policy was adopted in 1987 and the revised policy has been adopted in 2002 by the National Water Resource Council with the objective that each state has to formulate its own state water policy. The government has launched water related development schemes such as "Swajaldhara Yojana" and "Yojana Hariyali". These schemes are playing a crucial role in proper use and conservation project of water in villages. It is an initiative, though the presence of water is limited it can be used much more efficiently. There should be growing efforts to make people aware of water concerning issues. United Nations (UN) and India proclaimed the year 2003 as the 'International Year of Freshwater'. In Maharashtra, the Maharashtra Pollution Control

Board (MPCB) is performing a major role for the assessment, conservation and maintenance of water reservoirs.

In India several environment legislation, acts, rules, notification and amendments have been formulated to prevent and to control the water pollution as well as restoration of water sources. These are as follows.

- i) The Water (Prevention and Control of Pollution) Act, Rules and Amendments 1992.
- ii) The Coastal Regulation Zone Notification, 1991.
- iii) The Oil fields (Regulation and Development) Act, 1984.
- iv) The Water (Prevention and Control of Pollution) Act, Rules and Amendments, 1978.
- v) The Water (Prevention and Control of Pollution) Act, Rules and Amendments, 1977.
- vi) The Water (Prevention and Control of Pollution) Cess Act. 1977.
- vii) The Merchant Shipping Act, 1970.
- viii) The Indian Fisheries Act, 1987.

Number of aspects have been discussed by many workers all over the world about the water quality. In 19<sup>th</sup> century Birge and Juday worked on Wisconsin Lake in America. Later on number of aspects is being exploited by number of workers. Welch (1952) treatise on Limnology, Tropical limnology by Beadle (1974), Limnology by Wetzel (1975), and Cole (1983) are some important literatures to be found. Hutchinson, *et al.*, (1929) has recorded seasonal variation in the chemical physical properties of the water of Strait of Georgia in relation to phytoplankton.

As per Singh and Mcfeters, (1992) microbiological monitoring of drinking water has been practiced in the United States and other countries since the beginning of this century. Khalil (2000) studied the impact of pollution on productivity and fisheries of lake Mariut, Egypt.

The water is important and related to number of components in aquatic ecosystems. The water quality affects various factors so the status of water should be evaluated. The interrelationship between various components has been worked out by several workers. Dey (1977) has performed some limnological observations of an Oxbow lake in Kamrup district. Singh (2000) carried out evaluation of physico-chemical parameters in an Ox-Bow lake. Ganapati (1940) studied the ecology of a temple tank containing permanent bloom of *Microcystis acculoginosa* (Kutz). Synudeen (2004) have studied hydrology and phytoplankton in the Kallada river Kerala. Srivastava and Srivastava (2006) have given diversity indices for water pollution monitoring.

Monitoring of surface water is one of the important aspects. River is one of the forms of surface water. In India numbers of rivers have been studied for water pollution level as well as for their water quality. Abbasi *et al.*, (1996) worked out the Water quality of river Punnurpuzha of Kerala. Agrawal and Kannan (1996) conducted a study on degradation of river due to diffuse activities in river Mandakini. Ahamad and Jain (1996) assessed pollution load of Kerwan Dam water at Bhopal during pre-monsoon season. Heavy metal distribution in river Jhangi has been worked out by Baruah *et al.*, (1996). Chaturvedi *et al.*, (1996) evaluated drinking water quality of Kolar Dam water, Madhya Pradesh. Indrabai and George (2002) has carried out the assessment of drinking water quality in selected areas of Tiruchirapalli town after flood. Singh *et al.*, (1999) studied the limnochemical characterisation of river Ghaghara in U.P. Desai (1995) studied the water quality of Dudhsagar river of from Gao. Sahu *et al.*, (1996) performed the study on diurnal fluctuation of some water quality parameters of the river Ganga at Rishikesh-Kanpur. Jameson and Rana in (1996) have describe the pollution status of the river Sabarmati of Kheda region of Gujrat. Quadri *et al.*, (1993); Mathur *et al.*, (1988) has carried out the study on pollution of river Ganga at various regions. Bhosale and Rao (2001) reported the bacteriological quality of river Godavari water before and after treatment. Choubey (1995) from National institute of hydrology carried out studied the water chemistry of Tawa river and reservoir in central India. Dasgupta *et al.*, (2001) evaluated the river

Brahmani and groundwater basin village Timjore, Orissa and water utility in agricultural sector for irrigation purposes. Pande (2001) carried out an integrated Pollution study of surface water sediments and ground waters of river Ranganga at Moradabad. Sarkar *et al.*, (2002) studied the physico-chemical characteristics of Hindon and Narmada rivers. Bhadra *et al.*, (2005) carried out the investigation of some basic physico-chemical parameters of water of the north Bengal terai river kaljani which is one of the tributary of river Torsa, and comparison thereof with the mainstem. Vishnoi and Srivastava (2005) studied the seasonal pollution and assessment through comparative hydrological studies in river Jojari at Salawas, Jodhpur.

The reservoirs are also the important source of surface water and have been worked in several parts of country. Dhankar and Sangwan (2004) conducted water quality assessment from different regions of Mahendragarh, Haryana. Jain *et al.*, (1996) carried out the Seasonal variation in physico-chemical parameters of Halali reservoir of Vidisha district. Evaluation of physico-chemical and biological characteristics of water sample in water reservoirs around Rono hill, Doimukh (Dist-Papumpare), Arunachal Pradesh has been carried out by Dwivedi and Sonthoshi (2004). Sreenivasan, *et al.*, (1997) has performed limnological study of shallow water body (Kolovoi lake) in Tamilnadu. Nayak *et al.*, (2004) investigated variation of water quality in Chilka lake, Orissa. Singh and Mathur (2005) performed investigation of variations in physico-chemical characteristics of a fresh water reservoir of Ajmer city, Rajasthan.

The ground water is major source utilized all over the world. It is considered that the groundwater is relatively less polluted than that of surface water. Gupta *et al.*, (2004) has performed Chemical analysis of ground water of Sanganer area, Jaipur in Rajasthan. Krishna *et al.*, (1996) studied the water quality parameters of bore wells of Reddigudem mandal. Jain *et al.*, (1996 b) evaluated the ground water quality in district Hardwar. Singanan and Rao (1996); Gupta and Saxena (1997) ; Baruah *et al.*, (1995); Jaykumar *et al.*, (1995); Biswal *et al.*, (2001) ; Das *et al.*, (2001); Mohapatra

*et al.*, (2001); Dhakad and Chaudhary (2005) studied the ground water quality of various sites in India. Murugesan *et al.*, (2005) has carried out the comparative study of ground water sources from central to western region of Chennai, India.

Hydrographic features of various coastal ecosystems have been studied by number of workers. Reddy *et al.*, (1979) studied the seasonal variation in hydrographic conditions of estuarine and oceanic water adjoining the old Manglore port. Zingade *et al.*, (1979) has performed physico- chemical studies on coastal pollution of Bombay. Kalita, *et al.*, (2006) carried out physico- chemical quality of Beel water in Morigaon District Assam. Lokhande and Kalkar (1996) studied the physico-chemical quality of water at Vasai Creek where development of industries, oil and grease spillage from ships and public sewage causing pollution. Mogal and Dube (1996) have worked out distribution of faecal indicator bacteria in mud and water at Dandi sea coast. Mohapatra *et al.*, (1996) studied Metal Pollution in harbour sediments of Pradip Port, east coast of India. Nandan and Aziz (1996) Water quality and benthic faunal biodiversity of a polluted estuary, Kadinamkulam by retting on the south-west coast of India. Madhukumar and Anirudhan (1996) carried out the hydrographic features and chemical characteristic of Edava-Nadayara and Paravur backwater. Joseph (1987) studied the heavy metal pollution in the sediments of Cochin estuaries system.

The water quality degrades day by day. Number of reasons found involved in pollution of water. In India several workers have assessed the status of pollution in several water bodies. Studies on water bodies of India have been carried out by Amathussalam and Ganagansan (2004) on physico-chemical and bacteriological studies of tannay effluent polluted ground water in Triuchirappalli. Kannan and Chaurasia (1996) carried out assessment of Enviro-ecological status and physical degradation of river Mandakini. Jain *et al.*, (1996 c) studied the seasonal changes in heavy metals in water and sediment of an eutrophic lake of lower lake of Bhopal. Sharma *et al.*, (2002) carried out impact of industrial pollution on ground water quality in Kalmeshwar area Nagpur district. Ilangovan and Vivekanadan (1987) have

analysed oil pollution containing phenolics, heavy metals and hydrocarbons and its suitability for agricultural purposes. Banerje *et al.*, (1995) assessed the water quality in the samples of water from coal mine of Umaria collieries of Madhya Pradesh. Shastri *et al.*, (1999) studied the water quality and algal flora of percolation tank of Pimpalgaon. Panda *et al.*, (1996) studied pollution by seasonal water quality assessment of Jajang iron ore mining area. Kataria (1995) studied the toxicity and sublithal toxicity of soaps and detergents and bio refractory organics which creates pollution and ecology of water, microbes, flora and fauna in the polluted sites. Mahapatra *et al.*, (1995) studied the groundwater contamination by organochlorine insecticides residues such as DDT and BHC, etc in rural area in the Indo-Gangatic Plains near Furrukhudabad. Singh and Singh (1994) have performed bacteriological study of river "Varuna" water at Varanasi with respect to coliform bacteria which varies as per other factors such as physico- chemical properties. Dhanapal and Shivkumar (1988) have investigated effect of tannery on the water quality of the river Cauvery in Tamilnadu. Handa (1988) made an effort to study the effect of mining on pollution surface and groundwater. Gupta *et al.*, (2000) carried out a study on methaemoglobinaemia in areas with high nitrate concentration in drinking water. The basic data for pollution can be collected through conventional and remote sensing methods, Katpatal *et al.*, (2002) performed the water quality parameters extraction through remote sensing techniques. Sharma *et al.*, (2002 a) studied the nitrate pollution in ground water of Nagpur city area. Piska *et al.*, (2005) investigated the impact of pharmaceutical industrial effluents on the ground water of Mahaboobnagar district, Andra Pradesh. Singhal and Mahto (2004) assessed the role of water hyacinth in the health of a tropical take.

Various workers carried out the important work for showing interaction of physico-chemical characteristics and other factors. Isaiarasu (1999) has worked out diurnal changes in the physico-chemical parameters and zooplankton composition in the surface water of a pond in Sivakasi (Tamilnadu) in relation to lunar periodicity. The phytoplankton composition of Chitrapuzha, and biomass production has been investigated by Joseph and Joseph (1999) in view of the potential hazards to fishery.

Chawdhury *et al.*, (2000) have studied the effect of inorganic fertilizers on some physico-chemical parameters of water and production of zooplanktons in various seasons. Gulkiz *et al.*, (1999) carried out the study of the relationship between microfauna and water quality in biological sewage treatment plant of Yunzuncu Yil University in Van. Pende (1995) has assessed impact of combined effluents from distillery and sugar mill units of Nawabganj township on hydrobiology of the Parvati lake. Ahamad *et al.*, (1995) investigated the diurnal variation of phytoplankton and physico-chemical factors of two ponds of Madhubani. Pandey *et al.*, (1995) have reported the seasonal abundance of phytoplankton in relation to certain ecological conditions in the stretch of Koshi river. Biswas and Konar (2001) have studied the influence of hazardous industrial waste on plankton during the different seasons in a river Damodar in Durgapur in West Bengal. Kundangar and Abubaker (2001) have evaluated the post dredging changes in the physico-chemical and microfloral biodiversity and comparative limnology of Dal Lake Kashmir. Saxsena and Shrivastava (2001) have investigated the primary production by phytoplankton in a sewage fed lake and energy transformation to fish yield.

In India there are number of holistic places, where large number of ritual activities takes place. These activities play major role in pollution and this has been studied by several workers. Gowd and Kotaiah (2000) have studied seasonal variation of water quality of Kalyani reservoir near Tirupati. Panda and Patel (1996) have studied the impact of dead body cremation wastes on the water quality of river Saryu at Ayodhya which deteriorates with heavy load. Kumaresan and Kumari (1996) have studied the Courtallam where many water falls are found and the water has medicinal properties. Monitoring of Ramganga river during Ganagsnan (Mass bathing) suggesting greater load of pollution found in the studies of Chandra *et al.*, (1996). An examination of river Ganga at Phaphamau (Allahabad) during Mahakumbh and effect of mass bathing was carried out by Srivastava *et al.*, (1996). Study of impact on the quality of water due to pilgrim inflow, industrialization and agriculture in the town of Tirupati was carried out by Venkata Mohan and Jayarama Reddy (1995). Singh *et al.*, (1989) carried out the mass bathing effect on water quality of sangam during Maha



Kumbha Mela at Allahabad. Sinha *et al.*, (1986) assessed water quality of Ganga water at Dalman (Rae Bareli) on Kartika Purnima showing the result intensity only due to bathing. Panda *et al.*, (2004) have assessed the water quality status of 5 major temple ponds of Bhubaneswar city. Evaluation of deterioration of water quality during mass bathing in Surya Kund, Lohargal (Rajasthan) was done by Chandra and Prasad (2005). Kumar and Sharma (2005) have studied the physico-chemical characteristic of lentic water of Radha Kunda (District-Mathura).

In Maharashtra the work on several water bodies have been carried by several workers. Trivedy *et al.*, (1984) has evaluated 11 talukas of Satara district of Maharashtra for drinking water quality. Garud (1983) has conducted study on water quality problem in Kolhapur and Karad city. Goel and Chavan (1991) studied the limnology of polluted freshwater tank. Goel and Bhosale (2001) have studied the river Panchganga at Kolhapur with special reference to human impact on water quality. Goel *et al.*, (1985; 1986) have studied the limnology of few freshwater bodies in south western Maharashtra with special reference to chemistry and phytoplankton. Pangare *et al.*, (2004) have prepared project for the “Commercialization, Privatization and Universal Access to Water” United Nations Research Institute for Social Development (UNRISD) case study of the state of Maharashtra. Bisen *et al.*, (1995) have conducted ground water pollution study for the evaluation of usability of water in drinking and irrigation, Visapur Nala basin, district Chandrapur. Fokmare and Musaddiq (2001) have studied the comparative physico-chemical and bacteriological quality of surface and ground water at Akola (Maharashtra). Sharma *et al.*, (2002) performed the study of ground water pollution by domestic sewage and faecal matter discharged into dry duweells in Jarud area of Amaravati district. Bahador *et al.*, (2005) have investigated seasonal variations of microbial pollution in surface water of Pavana river for various seasons in Pune city.

In Shivaji University the work has been carried out by various workers for the assessment of water, in those workers Bhosale *et al.*, (1994) have carried out the survey and status report on some wetlands of Maharashtra. Bhosale (2004) has

conducted studies on the Ground water qualities from some villages around Kolhapur District. Patil (2003) has worked on Ecological studies in some lentic water bodies of Kolhapur city. Study on Quality of surface and ground water in Panchaganga river basin Kolhapur District has been done by Kulkarni (1993). Lomte (2003) has worked on studies on drinking water pollution of Kolhapur. Hujare (2005) has studied the hydrobiological features of some water reservoirs of Hatkanangale tahsil. Pailwan (2005) has worked out the limnology and fisheries potential of perennial tank of Kolhapur district. There is no work on Jotiba (Wadi Ratnagiri) water bodies, hence the attempt is made here.