**Literature review:**

In the study of the quality of drinking water in Dhakuakana subdivision of Lalhimpur dist, Assam, India, research analyzed 30 water samples from study area for pH, total hardness, fluoride, nitrate, arsenic, sodium, potassium & iron using standard method such as APHA-AWWA – WPCF 1995. Researchers found that concentration of all parameters were within the permissible limit except Iron (1).

In another research work, Physico-Chemical characteristics of Khadakwasla reservoir near Pune were monitored for Physico-Chemical parameters like temperature, pH, electric conductivity, Sodium, Potassium, Calcium, Magnesium, Silica, Iron, Bicarbonate, Chloride, Sulphate, Nitrate, Phosphate, dissolved Oxygen, biological Oxygen demand & chemical Oxygen demand. These parameters were analyzed by collecting water samples at 4 different locations of reservoir from July-2005 to Jan-2006. From this study, it is observed that there is a seasonal variation in concentration of Physico-Chemical parameters & some of parameters are beyond permissible limit, which shows degradation of water quality due to pollution (2).

A study of geochemical effect on the Physico chemical properties of different sources of water in Nagpur Municipal area of Maharastra, Shivankar V.M. reveals the facts that in the present investigation, 3 different water sources samples of Nagpur area were collected & various chemical parameters were studied from the results & discussion. It is concluded that in the same Nagpur municipal area, when compared the results in case of bore water, lake water and well water, lake water was found to be more suitable for human beings for all purposes (3).

In the present study 130 water samples in clean poly—bottles from different sources Viz. hand pumps, open wells, tube wells, water supply were taken & preserved according to standard methods, A titrimetri ( complex metric ) method prescribed by American public health association (APHA7) was followed for estimation. Calcium hardness (Ca-H) ranged from 50 to 480 mg/l, minimum Ca-H was observed from Inderpura village where as maximum Ca-H was reported from Badoli Village. Ca-H was found to be within the limit in 48%. Villages, where as 42% villages are higher. (4).
In the study of, using an innovative technique for removal of fluoride from drinking water, researcher, analyzed that for sorption studies, contact time is one of the most important parameter as it decides the efficiency of the system. The study on the contact time revealed as the contact time increases, % removal increases rapidly, but gradually approaches to constant value exhibiting the attainment of equilibrium (5).

In another research study work, the evaluation of water quality index around WCL, Kolera-Pimpari coal mines. Objectives of this work is to provide information on the ground & surface water Pimpari area in order to appreciate the impacts of mining activities on the quality of water and to discuss its suitability for human consumption from the water quality index values. Water quality of Pimpari village which is very near to open cast coal mines (WCL Kolera Pimpari) were calculated by considering 8 parameters namely pH, total hardness, TDS, Chloride, Nitrate, Sulphate & Sodium. Study revealed that water quality is poor at naalha & unfit for human consumption without treatment, whereas river & ground water is acceptable. (6)

Research work carried on the drinking water quality of coal mine surrounded lime industry area, by Sunanda.A, revealed that most of the parameters are within the permissible range of WHO & IS-10500. The seasonal variation for pH, temperature, fluoride nitrate, total hardness, chloride, turbidity, electrical conductivity, alkalinity, total dissolved solids, sulphate, phosphate etc, are low in summer. The TDS, alkalinity as expected are high in summer. The above investigation suggest that a detailed survey & study of air, water & soil in the area is required especially the air pollution (7)

According to the research topic, pollution analysis of water in lime industry area by Shaskikant R, Reveals the facts that lime is used in industrial & mining, waste water treatment. It neutralizes acid waste, adjusting pH, removes Phosphorous, fluorine, Magnesium & organic matter & it precipitates heavy metals. In fact lime treats potable & industrial water supplies including drinking water which disinfects bacteria. Because of above characteristics of lime though it is polluting the atmosphere still its natural presence in the area on the other hand must be blessing for purification of water (8)

Another research work deals with the physico chemical analysis of characteristics of bore wells at Himalaya Vishwa residential area, Wardha. The physico chemical tests were
conducted employing standard scientific methods like conductivity, calorimetry, pH metry, heavy metal analysis etc, In the present study the water samples shows colorless, odourless & agreeable & hence water can be considered for human consumption (9).

A study was carried out to assess the concentration of 6 heavy metals namely (Cr, cu, Fe, Pb, Mn & Zn) in water Kanhargaon dam near Chhindwara city. ABS was used for estimation of heavy metals,. These are within the limits as prescribed by WHOP & ICMR (10)

In the study of the assessment of ground water quality in Kokrajhar district of Bodoland territorial council, Assam, it is observed that values of most of the parameters are within the WHO permissible limit. The ground water is very rich in iron (>0.3 mg‘l) & is not suitable for drinking & laudering. So many factor like the absence of scientific drainage system, poor sanitary system, presence of stagnant water, unhygienic conditions etc, are causing water quality degradation & these causes have to be eliminated to maintain the quality of water & get relief from the fatal diseases (11)

A study carried on the assessment of surface water quality during monsoon and post monsoon season of Rupahi beel of Nagaon district, Assam, India. Nilotpal Kumar. B, revealed that the relevant parameter such as Temp, pH, TSS, TDS, free Co₂ alkalinity hardness, chloride, sulphate, phosphate and heavy metals were analyzed for water samples by various standard methods & reveals that most of the water quality parameters are within the tolerance level as prescribed in IS 2296. TDS & DO values in some locations are not so good for fish as well as aquatic life. The concentrations of heavy metals are not negligible (12).

This study was aimed to determine pH, turbidity, DOS & BOD reduction from municipal waste water. The present study reveals the assessment of Physico chemical parameters like pH, turbidity, DO & BOD high concentration in inlet & low concentration in the final treated waste water due to various stages of municipal wastewater treatment plant (MWWTP) Bhopal (13)

Another study was done on ground water samples of Sangamner area, Ahmednagar district, Maharashtra, to evaluate the chemistry of ground water. The Physico chemical analysis of 53 open wells water was carried out by standard methods. The study reveals that intensive irrigation has serious effect on the quality of water (14)
Analytical studies on water quality index of river Tapti by Mishra.P.K, includes the study aimed at using the application of water quality index (WQI) in evaluating the quality of river Tapti for public usage. This was done by subjecting the 52 water samples to comprehensive Physico chemical analysis using APHA standard method, study clearly indicates that water of river Tapti can be used for public consumption without any treatment (15)

Chemical analysis of ground water at some selected sites in Jaipur (Rajasthan) was carried out with respect to pH, EC, Mg$^{+2}$, Ca$^{+2}$, Na$^+$, K$^+$, Cl$^-$, SO$_4^{2-}$, NO$_3^-$, HCO$_3^-$, F$^-$, SiO$_2^-$ and heavy metals such as Fe, Co, Cu, Pb, Ni, Zn, Mn, at 5 selected sites at Jipur. Bicarbonate was determined by acid-base titration using bromo cresol green indicator. Cl$^-$ was determined by titration with AgNO$_3$ using K$_2$CrO$_4$ indicator. Ca$^{+2}$ and Mg$^{+2}$ were determined by EDTA, content of metal by AAS. Na$^+$ and K$^+$ were determined by flame photometer. SO$_4^{2-}$ gravimetrically. NO$_3^-$ by spectrophotometrically using brucin method. It was found that concentration of NO$_3^-$ was high due to fertilizers, human sewage deposited in septic systems and domestic and municipal waste water. (16)

The present investigation is to examine the quality of ground water and its suitability for domestic purposes by using WHO and ISI standards. It was found that the ground water was contaminated at few sampling sites namely APMC yard and Girish Nagar (Open Wells). The sampling sites Siddarameshwar colony and Kadapathhi showed physico Chemical parameters within the water quality standards and quality of water is good for drinking purpose (17)

The present study deals with in an analysis of heavy metal contamination in 72 number of ground water samples drawn from 24 different locations selecting 6 sites from each of the 4 directions of out skirts of Kota city of Rajasthan, India , in pre Monsoon period of years 2006 to 2008. At all the selected locations, ground water is used for drinking and domestic purposes containing level of iron, copper, zinc, lead, manganese, and chromium were estimated following the standard procedures. Data reveals that in western, southern and Northern block, Chromium concentration was higher whereas in Southern and Northern block, lead concentration was higher at some locations than the permissible limit (18).

Studies on the absorption of Cadmium (II) ions from waste water on two raw coals viz North Tisra and South Tishra collieries, along with their eight chemically treated coal samples were
carried out. The best results as far as improvement in adsorption capacity is concerned were obtained from acid alkali treated coals. This clearly indicates that it is not the reduction in the mineral matter content of coal by acid which is important for the improvement in the adsorption capacity, but it is the alkali treatment which changes the chemical character of both the organic mineral matter part of coal which ultimately results in improvement in its ion exchange capacity (19).

Another research study work, done on Fluoride contents in ground water and fluorosis in human population, in Haffaganj, Katihar block Katihar. In this research work researcher analyzed ground water samples for fluoride content. Concentration of fluoride was determined by ion selective electrode method. Analysis showed that fluoride ion level abnormal is between 0.7 to 0.10 mg/L (20).

In the study of physico chemical analysis of ground water of Ajmer city in Rajasthan, Pooja Tomar, the following parameters, total hardness, alkalinity, carbonate hardness, pH & conductivity etc are considered. From the observed data it is found that parameters like conductivity, TDS, F⁻, NO₃⁻ and hardness are higher in concentration from prescribed values from the analysis of ground water quality, it is observed that some of the sites are not suitable for drinking purpose as well as domestic purpose (21).

A study was done to find out impact of agricultural practices on ground water quality, ground water samples are collected from 5 villages around Ladpura thansil, situated in kota dist & analyzed during year 2008 to 2010, some important Physico chemical parameters like pH, total dissolved solids, alkalinity, total hardness, sulphate, chloride, nitrate, phosphate were analyzed & results were compared with water quality standards prescribed by WHO & BIS 10500. Data reveals that all the water samples showed not too much higher values which indicated that water is not polluted (22).

Physico chemical analysis of ground water quality in different wards of south zone of Bhuswal Tehsil, Bhusawal was studied. Samples are collected from 7 different wards of sampling points of the south zone of Bhusawal, Jalgaon district of Maharashtra in December 2009. Analysis results obtained in this study show that the ground water quality is rather good, there is no fear of water quality problem & related health in near future to the
consumer. This study shows that as water quality problem arising in big cities but south zone of Bhusal district Jalgaon, Maharashtra is still safe as ground water quality is concerned (23).

A study in which ten different ground water samples in pre monsoon and after onset of monsoon were collected during the year 2009 from different India mark II hand pumps of extensively used different public places at Sultanpur district of UP. Ground water quality with reference to estimated physico chemical parameters was found to be poor at almost all the sites of study. The water is alkaline, harder, very hard & full of chemical contaminants. Contaminants are above the recommended drinking water standard. People dependent on this water are prone to health hazards of polluted drinking water and water quality management is the need of hour (24)

Physico chemical studies such as temperature, pH, Dissolved Oxygen, total dissolved solids, chloride, total alkalinity, calcium & magnesium hardness, sulphate, phosphate and Nitrate of bore wells water was carried out from 20 villages of Gondpipri town and its some interior adivasi (backward) area during year 2010, in order to assess water quality index. The results reveal that pH & TDS are in the same limits provided by WHO & ISI. Calcium, Mg, Sulphate, are in permissible limits. But phosphate, Nitrates levels are higher values that prescribed values. This may attributed to the use of fertilizers & pesticides in this remote adivasi area (25)

In the present study, Physico Chemical analysis of ground water samples of Firozabad district UP by Srivastava, he had collected groundwater samples from different places of Firozabad district UP India. These samples have been analyzed on the basis of various qualitative parameters. The results obtained in the present investigation show that the concentration of fluoride, electrical conductivity and total dissolved solids (TDS) were in excess where as nitrate & chloride were found in large amounts in some of drinking water sources & fluoride amount was noticed in very high range which may cause health hazards for human beings. (26)

In the study of Analysis of bore wells drinking water in Vidisha (MP) by Bhavna Chauhan, reveals the facts that the results of samples changes with different collecting places because of the different nature of soil contamination (27)
In another study the physico chemical parameters and planktonic composition of Hosahalli pond were studied for a period of 12 months from Jan to Dec 2010. The results of physico chemical analysis revealed that water is polluted as it possesses high BOD, free CO$_2$ & phosphate. Conclusively these parameters along with the physico chemical characteristics were found to be affected by surface run off and other excessive human activities (28).

Study of fluoride contamination in ground water of Mandawa area of Jhunjhunu district (Rajasthan), the heritage city of shekhawati, reveals the fact that ground water of Mandawa areas is highly contaminated with fluoride. Most of the ground water samples were found to be highly contaminated with fluoride while few water samples were suitable for human consumption. The results of this study helps in getting awareness of health hazards of contaminated water. Overall the quality of water is unsatisfactory for drinking purpose in the investigated area (29).

In another study, the fingerlings of Mugil Cephalous was exposed to acute toxicity test under static renewal bioassay to cadmium, copper, lead & Zinc. The fingerlings were sensitive to copper followed by cadmium and lead. The fingerlings of M cephalous showed tolerance behavior towards Zinc (30).

Fluoride contamination in water of Koshi region (Bihar) was also carried out. Fluoride concentration values varied from 0.6 mg/l to 1.6mg/l. Due to this, citizens were suffering from different types of fluorosis. (31)

Geochemical studies of fluoride and other water quality parameters of ground water of Sikar district (Rajasthan) was also carried out. Water samples were alkaline in nature. Chloride content was found to be high. Fluoride concentration was found to be maximum. According to researcher dilution of fluoride rich water with fluoride free water should be encouraged (32).

Ground water quality of coastal areas in Alappuzha district Kerala was carried out for analysis of bore and open well water of coastal areas. Standard methods were used for all the analysis. It was found that 9.4% open well water was hard and high alkalinity value. Fluoride concentration found to high in some region. Also Sodium and Potassium concentration was found to be high (33).
The literature survey reveals that no relevant water quality assessment studies are done in prescribed study area so far. This study will be useful to assess and compare physical and chemical characteristic properties of water in selected sites in the prescribed study area, which will throw light on the quality of runoff water in the vicinity of Pune.