

The Physico-Chemical Parameters of Water and Locked Soil of Different Reservoirs of West Nimar M.P. (INDIA)

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Abstract- The water quality is an index of health and is one of the areas of major concern to environmentalists, since industrialization, urbanization and modern agriculture practices have a direct impact on the water resources. The investigation was carried out to study the water as well as locked soil of different reservoir of West Nimar, M.P. India. The change in physico-chemical parameters of water such as water temperature, ph, total hardness, Ca hardness, Mg hardness, alkalinity, carbonate alkalinity, bicarbonate alkalinity, chloride content, colour were analyzed. As above the physic-chemical parameters of locked soil such as ph, colour, temperature, grain seize, specific gravity, moisture content, elasticity and plasticity were analyzed. The result indicated that the some physico-chemical parameters of reservoir water and locked soil were within the permissible limits and can be used for domestic and irrigation purpose but some of the parameters were above slandered for drinking water so there is need for strict monitoring to ensure quality water supply for human health ,irrigation and fisheries.

Keywords – Physico-chemical parameters, locked soil, chloride content, alkalinity, hardness, plasticity

I. INTRODUCTION

Much of the current concern with regards to environment quality is focused on water and soil because of its importance in maintaining the human health and health of the ecosystem. The quality of water and locked soil in any ecosystem provides valuable information about the available resources for supporting life in that ecosystem. The quality of water and locked soil depends as a large number of physico-chemical parameters and analysis. The impact of water pollution and soil pollution on the human being has recently become a favorite subject for investigation in the world.

The industrialization and development in agriculture are necessary to meet the basic requirement of people; at the same time it is necessary to preserve the environment. The Village effluent waste waters are loaded with pollutant, along with other chemicals used during agriculture are also responsible for water and soil pollution.

The aim of the study is to reveled out the pollution status of reservoir in terms of physico-chemical characters of water and locked soil. The reservoir contain soil which covered by water called locked soil. In the water depth of approximate 3-4 feet soil samples collected for investigation and analyzed. The pollution of lakes and reservoir and their biological diversity are directly related to the health of human beings.

The main aim of this work has to analyze various physico-chemical parameters of water and locked soil of reservoirs of West Nimar M.P. With the analysis of these parameters of water and locked soil shows the pollution status of water and locked soil of this region.

Due to tremendous development of industry and agriculture, the water ecosystem has become perceptibly altered in several respects in recent years and as such they are exposed to all local disturbances regardless of where they occur. The increasing industrialization, urbanization and developmental activities, to cope up the population explosion have brought inevitable water crisis. The health of lakes and their biological diversity are directly related to health. In

freshwater bodies, nutrients play a major role as their excesses lead to eutrophication. Excessive macrophytic vegetation is indicative of the eutrophication status of any water body.

Monitoring of water quality is the first step that can lead to management and conservation of aquatic ecosystems. It is also true that the management of any aquatic ecosystem is aimed to the conservation of its habitat by suitably maintaining the physico-chemical quality of water and locked soil within acceptable levels.

II. MATERIALS AND METHODS

The soil and water samples were collected from three different sites of different reservoirs during different months. The collected samples have been analyzed to determine their physico-chemical characteristics. The water and soil samples were collected in morning time during season. Temperature and pH was recorded on the field. Water and locked soil samples were collected in cleaned acid washed plastic bottles and sterilized plastic bags and stored at 4°C. The soil samples have been analyzed for various parameters as pH, plasticity, elasticity, moisture content, specific gravity. Physicochemical parameters of water and locked soil were done by standard methods.

Three sampling station namely, point 01, point 02, point 03 were selected for analysis of physico-chemical characteristics of water covering whole area of the reservoir. The reservoirs located at the different part of city are undergoing rapid urbanization and agriculture purpose.

Reservoir, a small man-made dam with 100.00 ha water spread area, was built over a Small rivers. These reservoir is a multipurpose point tank used for different activities like drinking water supply, irrigation, fisheries etc.

A. Sampling Procedure and Laboratory Analysis-

Water samples were collected from all three sampling stations. Monthly samples of sub-surface water in triplicate were collected during different month in the early hours of the day (7 a.m. to 9 a.m.). Iodine treated double stop par polyethylene bottles were used for collection of water samples. Bottles were kept in ice bucket and brought to the laboratory for analysis. Some of the physico-chemical characteristics of water including water temperature, depth, color, transparency, pH were determined using mercury thermometer, graduated string, visual, Secchi disc, digital pH meter, respectively, total alkalinity, total hardness, chlorides, calcium and magnesium Hardness, were analyzed using titrametric method at the laboratory of Department.

The different Reservoir of West Nimar is SATAK, SANGWI, SADLI, SEAGWAL and NARAWALA Reservoir. The different parameter of water and locked soil of different reservoir are shown in table 1 and 2. All the reservoir are located in West Nimar region.



Figure no. 01 Photo of Seagwal Reservoir



Figure no. 02 Photo of Seagwal Reservoir



Figure no. 03 Photo of Narawala Reservoir



Figure no. 04 Photo of Satak Reservoirs

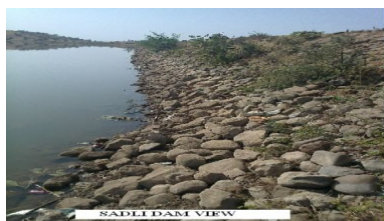


Figure no. 05 Photo of Sadli Reservoir

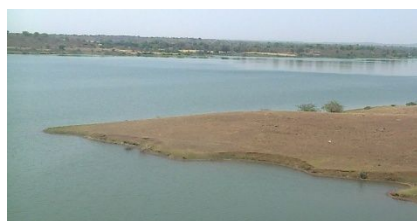


Figure no. 06 Photo of Sangwi Reservoirs

B. Reservoir

There are five Reservoir of West Nimar were selected for study these are SATAK, SANGWI, SADLI, SEAGWAL and NARAWALA Reservoir. In reservoir, maximum water level was recorded in post-monsoon period while minimum water level was recorded in summer season during both the years of study. Water was turbid in monsoon season with yellow brown color, while green color in winter and transparent green color was observed in summer season. The transparency of water is mainly affected by factors such as biological productivity, suspended particles and water color. The transparency in reservoir ranged from 65.4 – 80.5 cm with low value during monsoon season. Settlement of sand, silt and clay result in a higher transparency from the post-monsoon period reaching a maximum of 110.00 cm marks the highest transparency in this reservoir. Conductivity measures the capacity of a substance or solution to conduct electrical current and that falls within the range observed for Indian waters. According to this criteria, reservoir water falls under the category of mesotrophic water body. Clay, silt, organic matter, plankton and other microscopic organisms cause turbidity in natural waters.

III. RESULTS AND DISCUSSION

The physico-chemical properties of soil of agricultural region and the water used for irrigation in area of West Nimar were analyzed in the present study. The physico-chemical characteristics of the effluent water showed that water analyzed in this study had pH 6.90 to 7.00. The physicochemical characteristics of the effluents differed substantially from one another with respect to chemical characteristics, as expected due to a relatively wide spectrum of effluent and temperature 30 to 35°C. A wide variation in the physico-chemical properties of soil of agricultural region and the water in reservoir area were found in the present study (shown in table 1 and 2). Different samples of soils and water from the reservoir area showed difference in the physico-chemical characteristics from one another with respect to chemical characteristics, as expected due to a relatively wide spectrum of agriculture effluents sources and due to presence of chemical in the effluent.

In all the reservoirs, SATAK reservoir shows high value of total hardness, calcium hardness and magnesium hardness parameter which is within the permissible limit but higher than other reservoirs of Nimar region. It means it contains more ions than other water sample.

Table 1:- Parameters of water of different

PARAMETER	SATAK DEM	SADLI DEM	SANGWI DEM	SEAGWAL DEM	NARAWALA DEM
Colour	Pale yellow	Pale yellow	Light yellow	Pale yellow	Pale yellow
Odour	Sweet	Light sweet	Light sweet	Light sweet	Light sweet
Ph	6.0	6.8	7.5	7.0	7.5
Temperature	32	35	34	35	28
Total hardness	760	150	145	110	100
Ca hardness	160	128	28	24	20
Mg hardness	599	22	117	86	80
Alkalinity	75	125	67	75	95
Chloride content	78.1	70.5	35.6	106.5	74.55
Transparency	68.5cm	65.5cm	64.5cm	65.4 cm	66.5 cm

Table 2:- Parameters of locked soil of different Reservoir

PARAMETER	SATAK DEM	SADLI DEM	SANGWI DEM	SEAGWAL DEM	NARAWALA DEM
Colour	Black	Black	Grey	Black/grey	Black
Ph	7.0	6.902	6.92	7.0	6.9
Temperature	35	35	32	35	30
Grain seize	Cohesive	Partially Cohesive	Cohesive	Partially Cohesive	Cohesive
Specific gravity	2.60	2.65	2.50	2.62	2.54
Moisture content	29%	25%	26%	25%	31%
Plastic limit	42%	35%	36%	35%	42%
Liquid limit	45%	45%	45%	30%	42%
Electrical conductivity	107.11	135.40	134.32	145.5	125.5

IV.CONCLUSION

Conservationists are meticulously attempting to conserve the biodiversity from anthropogenic erosion and 'pre natural' extinction. The major barriers in conservation of biodiversity for sustainable life in future include In adequate data base, inadequate funding for research, confusions and controversies over area selection for conservation. This has made the task more and more difficult. On the basis of physicochemical characteristics it may be said that the reservoirs is a mesotrophic water body, which is slightly inclined towards eutrophication. The tropic status of reservoirs warrants a proper conservation and management and best possible use of the reservoirs, the macrophytes will have to be controlled. This can be achieved by mechanical removal or by biological means using grass carp. Since the removal of nutrients in the form of biomass can only check eutrophication. The nallahs, streams and rivers let's joining the reservoir should be obstructed by constructing stop and check dams. This will not allow the siltation in reservoir.

This soil study shows that considerable amount of soil and plant nutrients were lost through erosion in the northern upland areas of region. The observed differences in soil loss permitted an assessment of the impact of soil erosion on some soil properties.

This study also indicates that top soil loss due to accelerated erosion results in changes in soil properties. Changes in soil pH, elasticity, and plasticity and moisture contents were highly and positively correlated with cumulative soil loss. This study indicates the level of contamination at the waste and explores the relationship between ranges of quantitative variables. Thus the open waste should be discouraged and a proper monitoring and remediation plan is needed to reduce the chances of ground water pollution by leaching of these contaminants. Some physical properties and good amount of organic matter in soils indicate that these soils have the potential to be used in compost after various experimental treatments. The study is useful in providing indicators of contamination at such dams and thus will be helpful in making any remediation plan for these contaminated soils.

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