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# Indian Streams Research Journal



## COMPARATIVE ANALYSIS OF PHYSICAL PARAMETERS OF VARIOUS WATER ECOSYSTEMS IN WASHIM.



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### ABSTRACT

**W**ater is the most precious gift to mankind. Life on earth is not possible without water. It is the soul of nature. Limnological investigations on water bodies were generally aimed to assess the water quality and its interaction with biotic and abiotic factors. The physical and chemical properties of freshwater bodies are characterized by the climatic, geochemical, geo-morphological and pollution conditions. Increasing water pollution causes not only the change of water quality but also threatens human health and the balance of aquatic ecosystems, economic development, and

social prosperity. Therefore, there is a need to take the important step towards applying an appropriate quality management plans in order to eliminate water pollution. Water quality monitoring can help researchers predict and learn from natural processes in the environment and determine human impacts on an ecosystem. Deo talav, Ekburji dam, Padmatirth and R.A. College Fish farm are important source of water for Washim region, the assessment of water quality of this ecosystem is important for fishing purpose as well as drinking purpose too. In the present study physical parameters of four different sampling sites i.e. Ekburji dam, Padmatirth, Deotalav and R.A. College Fish farm of Washim region were analyzed comparatively.

**KEYWORDS** :Physical parameters, Limnology, Ekburji dam, Padmatirth, Deotalav, Washim.

## INTRODUCTION:

Ecosystem are a subset of Earth's aquatic ecosystem. They include lakes and ponds, rivers, streams, springs, and wetlands. They can be contrasted with marine ecosystems, which have a larger salt content. Limnological investigations on water bodies were generally aimed to assess the water quality and its interaction with biotic and abiotic factors. The physical and chemical properties of freshwater bodies are characterized by the climatic, geochemical, geo-morphological and pollution conditions. All species tolerate slow seasonal changes better than rapid changes. Freshwater ecology emphasizes mainly the study of relationship between organisms and the freshwater environment. Study of all aspects physical, chemical, geological and biological of freshwater is termed limnology. Aquatic features such as lakes and wetlands depend upon climatic conditions, geological events or biological actions to develop and maintain bodies of water.

Water quality testing is an important part of environmental monitoring. When water quality is poor, it affects not only aquatic life but the surrounding ecosystem. Water resources are declining day by day at the faster rate due to rapid urbanization and population load. Deterioration of the water quality is now a very big problem. Increasing water pollution causes not only the change of water quality but also threatens human health and the balance of aquatic ecosystems, economic development, and social prosperity. Therefore, urgent need to take the important step toward applying an appropriate quality management plans in order to eliminate water pollution. Water quality monitoring can help researchers predict and learn from natural processes in the environment and determine human impacts on an ecosystem.

Deo talav, Ekburji dam, Padmatirth and Pond water are important source of water for Washim region, the assessment of water quality of this ecosystem is important for fishing purpose as well as drinking purpose too.

Various researchers studied the physical parameters of fresh water ecosystems Shivashankar and Venkataramana (2007) conclude seasonal fluctuations of water quality parameters in selected points of Bhadra River of Karnataka. Physico-chemical and microbiological study of Tehri Dam Reservoir, Garhwal Himalaya examine by Agarwal and Rajwar (2010). Mahananda et al., (2010) examine physico-chemical analysis of surface and ground water in Bargarh District of Orissa. Jemi and Balasingh (2011) Studied on physico-chemical characteristic of freshwater temple pond in Kanyakumari District in which they discussed seasonal variations of pond water. Gupte and Shaikh (2013) studied the physico-chemical properties of Shelar lake in Bhiwandi. Sawant and Chavan (2013) presented Water quality status of Managaon Reservoir from Gadhinglaj Tahsil in which parameters of the water were compared with WHO (1984) standards.

## MATERIALS AND METHODS

The water samples were collected from four selected sampling sites.

### Sampling Sites:

Ekburji Dam is an earthfill dam on Chandrabhaga river near Washim in the state of Maharashtra in India. The Deo talav also known as Balaji talav present near Balaji mandir, a large square tank with stone built sides, strongly and handsomely finished and with a jalakridasthana, resting place for swimmers in the middle, was laid out at the time of the construction of Balaji mandir These place also known as Shiva temple. Washim is known to have had 108 Tirthas, holy places or sacred springs, associated with different gods and sages. The Padma Thirtha is one of the chief Tirthas erected by Lord Vishnu. Pond water are collected from R A college fish farm Washim, P.G Department of zoology in this

institute, Fisheries as an optional subject. For their academic make up of requirement they have three tanks in premises- A nursery pond (9mX5mX1.5m) a rearing pond (18mX9mX2m) and a plankton culture tank (5mX3mX1m) are constructed to conduct aqua cultural experiments.

For the present study, The water samples were collected from the four different sampling sites Ekburji dam, Deo talav, Padmatirth and Fish farm. Total five physical parameters that is pH, temperature, conductivity, colour, total dissolve solid (TDS) were analyzed by using standard methods of water analysis of APHA (1988).

**RESULTS AND DISCUSSION:**

During the present study, physical parameters of four different sampling sites i.e. Ekburji dam, Padmatirth, Deotalav and Pond water were analyzed comparatively which are depicted in the table 1.

| Parameter    | Ekburji Dam         | Padmatirth          | Deotalav            | Pond water          |
|--------------|---------------------|---------------------|---------------------|---------------------|
| Colour       | Green               | Yellowish green     | Pale green          | Olive green         |
| pH           | 6.9 ± 0.089443      | 7.2833 ± 0.183485   | 6.933 ± 0.10328     | 6.9 ± 0.219089      |
| Temperature  | 24.83333 ± 1.94079  | 24.58333 ± 2.615658 | 22.5 ± 1.516575     | 22.83333 ± 1.834848 |
| TDS          | 317 ± 31.21431      | 81.66667 ± 11.25463 | 263.3333 ± 57.50362 | 107.6667 ± 13.88044 |
| Conductivity | 0.397067 ± 0.045002 | 0.857383 ± 0.1531   | 0.963667 ± 0.502202 | 0.572983 ± 0.093424 |

**Table I : Physical parameters of four sites in Washim city.**

**Colour:**

Coloration is a unique properties of lake water on which we can determine the status and quality as well as roughly predicted the phytoplankton and zooplankton density of that lake. During the study periods in month of August the colour was Olive green , it might be due to monsoon during which some organic materials, sand particles are drained with flow of water, in September the colour was Yellowish Green and from October to December the colour was Pale green which might be due to plankton population increases in those months.

**pH:**

It is an important physical parameter as most of the biological process and biochemical reaction are pH dependant. pH is most important in determining the corrosive nature of water. Lower the pH value higher is the corrosive nature of water. The pH values recorded ranged in between 7.2 – 6.9 in six month seasonal variations. The seasonal change in pH of all four ponds is shown in table I. In the present investigation the maximum pH was observed in Padmatirth 7.2833 ± 0.183485 which followed by Deo talav 6.933 ± 0.10328 then Ekburji Dam 6.9 ± 0.089443 and minimum pH was observed in Fish

farm  $6.9 \pm 0.219089$ .

**Temperature:**

Temperature of the water is important for its effects on the chemistry and biochemical reaction in the organisms. It is essential factor in the aerobic environments of aquatic system, as it determines the succession of predominant species of algae, bacteria and other aquatic organisms. In the present investigation the maximum Temperature was observed in Ekburji dam  $24.83333 \pm 1.94079$  which is followed by Padmatirth  $24.58333 \pm 2.615658$  and Pond water  $22.83333 \pm 1.83484$ , minimum temperature are observed in Ekburji dam  $22.5 \pm 1.516575$ . The seasonal comparatively changes in Temperature of all four ponds are shown in table 1.

**TDS:**

Total dissolved solids denotes mainly the various kinds of minerals present in the water “Dissolved Solids” refers to any mineral salts, metals, cations or anions dissolved in water. Dissolved solids are important parameters in drinking water. Potability of water depends much on the dissolved solids. In the present investigation the maximum TDS was observed in Ekburji dam  $317 \pm 31.21431$  which is followed by Deotalav  $263.3333 \pm 57.50362$  and Pond water  $107.6667 \pm 13.88044$  minimum TDS are observed in Padmatirth  $81.66667 \pm 11.25463$ . The seasonal comparatively change in TDS of all four ponds is shown in table.

**Conductivity:**

Electrical conductivity (EC) a measure of the electric current that solution carries. Electrical conductivity used to quickly estimate the ionic or soluble salt concentration in soils, water supplies, fertilizer solution and chemical solution. In the present investigation the maximum Conductivity was observed in Deotalav  $0.963667 \pm 0.502202$  which followed by Padmatirth  $0.857383 \pm 0.1531$  and Pond water  $0.572983 \pm 0.093424$  minimum conductivity was observed in Ekburji dam  $0.397067 \pm 0.045002$ .

|                  | <b>Ekburji Dam</b> | <b>Deo Talav</b> | <b>Padmatirth</b> | <b>Fish farm</b> |
|------------------|--------------------|------------------|-------------------|------------------|
| <b>August</b>    | Green              | Pale green       | Yellowish green   | Olive gree       |
| <b>September</b> | Pale green         | Olive green      | Olive green       | Green            |
| <b>October</b>   | Olive green        | Green            | Pale green        | Yellowish green  |
| <b>November</b>  | Green              | Pale green       | Olive green       | Pale green       |
| <b>December</b>  | Olive green        | Yellowish green  | Green             | Olive green      |
| <b>January</b>   | Green              | Green            | Olive green       | Green            |

**Table II: Comparative analysis of colour from four different sampling sites.**

|           | Ekburji Dam | Deo Talav | Padmatirth | Fish farm |
|-----------|-------------|-----------|------------|-----------|
| August    | 6.8         | 6.8       | 7          | 6.5       |
| September | 6.9         | 6.8       | 7.2        | 6.8       |
| October   | 7           | 7         | 7.2        | 7         |
| November  | 7           | 7         | 7.4        | 7         |
| December  | 6.9         | 7         | 7.4        | 7         |
| January   | 6.8         | 7         | 7.5        | 7.1       |

Table III: Comparative analysis of pH from four different sampling sites.

|           | Ekburji Dam | Deo Talav | Padmatirth | Fish farm |
|-----------|-------------|-----------|------------|-----------|
| August    | 26          | 24        | 25         | 25        |
| September | 28          | 24        | 25         | 25        |
| October   | 25          | 23        | 25         | 23        |
| November  | 23          | 22        | 26         | 21        |
| December  | 23          | 22        | 27         | 22        |
| January   | 24          | 20        | 19.5       | 21        |

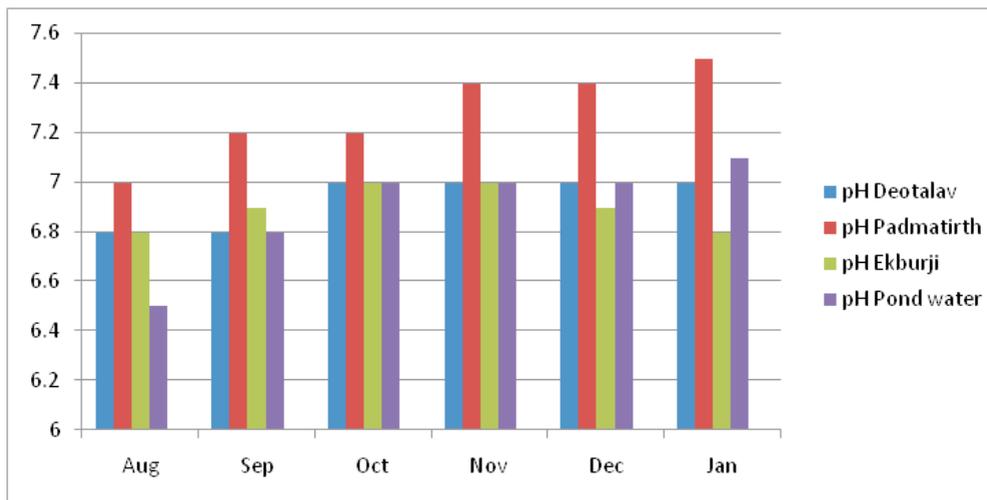
Table IV: Comparative analysis of Temperature from four different sampling sites.

|           | Ekburji Dam | Deo Talav | Padmatirth | Fish farm |
|-----------|-------------|-----------|------------|-----------|
| August    | 368         | 300       | 90         | 130       |
| September | 350         | 350       | 90         | 120       |
| October   | 310         | 280       | 85         | 100       |
| November  | 290         | 240       | 85         | 96        |
| December  | 284         | 210       | 80         | 100       |
| January   | 300         | 200       | 60         | 100       |

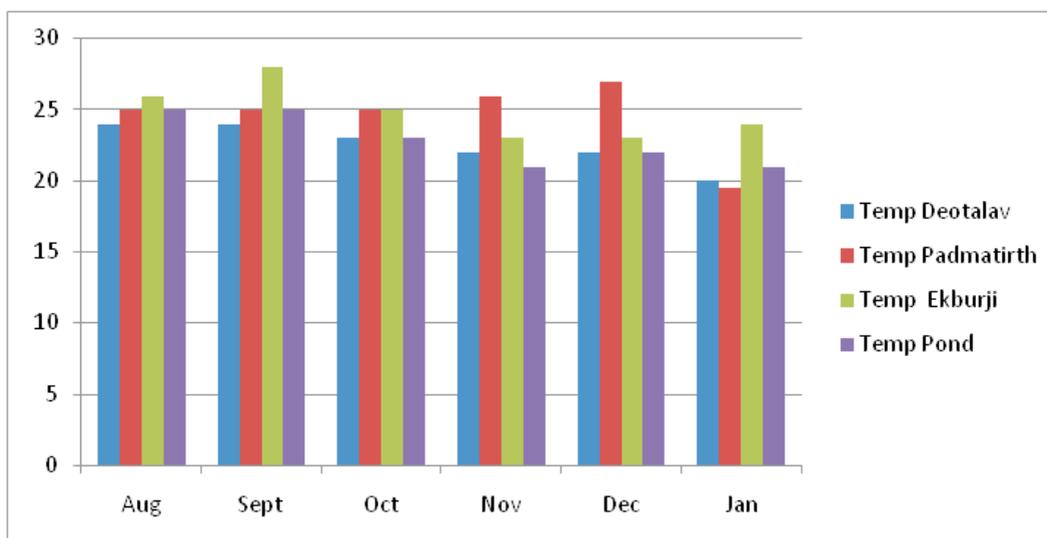
Table V: Comparative analysis of TDS from four different sampling sites.

|           | Ekburji Dam | Deo Talav | Padmatirth | Fish farm |
|-----------|-------------|-----------|------------|-----------|
| August    | 0.432       | 0.837     | 0.932      | 0.672     |
| September | 0.471       | 0.829     | 0.872      | 0.684     |
| October   | 0.368       | 0.652     | 0.576      | 0.576     |
| November  | 0.354       | 0.568     | 0.984      | 0.437     |
| December  | 0.373       | 0.946     | 0.974      | 0.539     |
| January   | 0.384       | 1.950     | 0.806      | 0.529     |

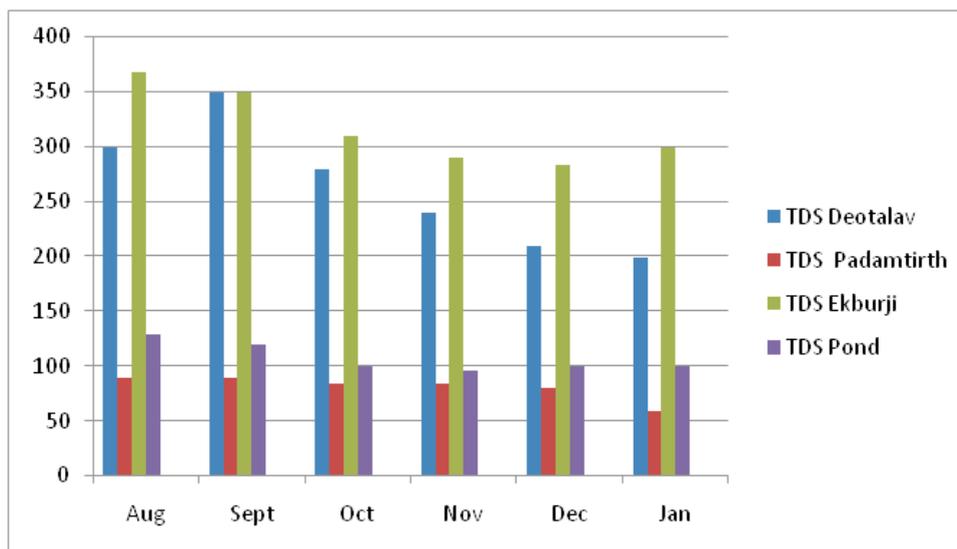
Table VI: Comparative analysis of Conductivity from four different sampling sites.



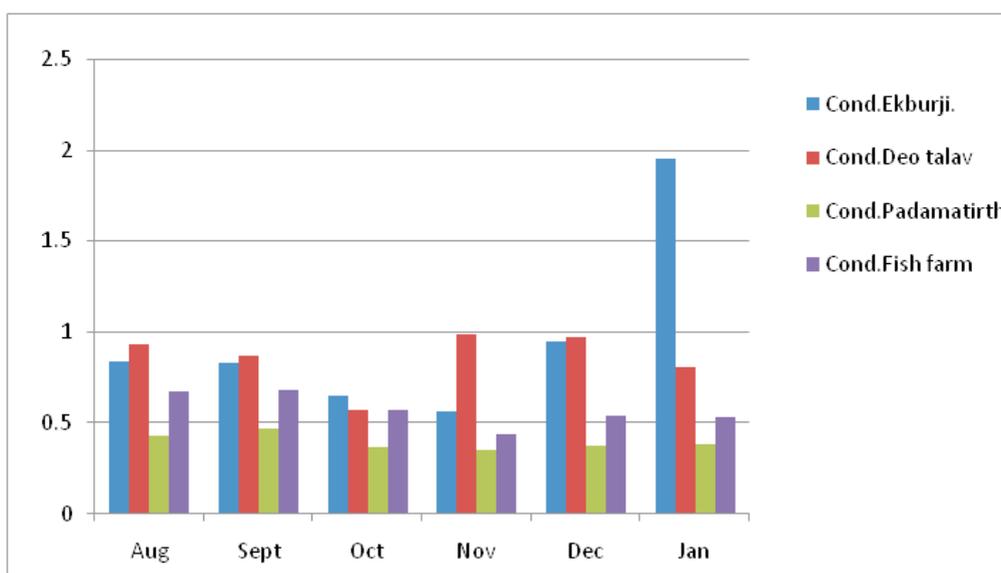
Graph plate I: Seasonal Change in pH of Four ponds in Washim city



Graph plate II: Seasonal Change in Temperature of Four ponds in Washim city



Graph plate III: Seasonal Change in TDS of Four ponds in Washim city



Graph plate IV: Seasonal Change in Conductivity of Four ponds in Washim city

In present work the water temperature range between 24-20 c. Average temperature of Ekburji dam was found to be  $24.83333 \pm 1.94079$  and Padmatirth average temperature was found to be  $24.58333 \pm 2.615658$  and Pond water  $22.83333 \pm 1.83484$ , low temperature was observed in Ekburji dam  $22.5 \pm 1.516575$ . The average value of pH is recorded in Padamtirth  $7.2833 \pm 0.183485$ , Deo talav  $6.933 \pm 0.10328$ , Ekburji Dam  $6.9 \pm 0.089443$  and lowest pH were observed in Pond water  $6.9 \pm 0.219089$ . The average value of TDS are observed in Ekburji Dam  $317 \pm 31.21431$ , Deotalav  $263.3333 \pm 57.50362$ ,  $107.6667 \pm 13.88044$  in Pond water and in Padmatirth  $81.66667 \pm 11.25463$  TDS are observed. The average value to conductivity are seen in Deo talav  $0.963667 \pm 0.502202$ , Padmatirth  $0.857383 \pm 0.1531$ ,  $0.572983 \pm 0.093424$  in Pond water and in Ekburji dam  $0.397067 \pm 0.045002$ mg/lit.

## CONCLUSION:

Monsoon and winter seasons show different seasonal fluctuations in various physical Parameters. The Ekburji dam which is the only source of drinking water to the Washim city, shows the permissible values for all physical parameters and hence it is fit for drinking also for the fishing purpose. Also the Deotalav and Padmatirth both the ponds have aesthetic values shows all physical parameters in moderate range. After observation of four sites it was concluded that water sources may be used safely for both domestic and irrigation. The wider human activity and the domestic waste in Padmatirth and Deotalav cause the eutrophication.

## REFERENCES:

1. Agarwal A.K. and G.S. Rajwar (2010): Physico-chemical and microbiological study of Tehri Dam Reservoir, Garhwal Himalaya, India. *Journal of American Science*, Vol.6(6) : 68-73.
2. APHA (1998): Standard methods for examination of water and waste water. 20th edition, edited by Lenore S. Clesceri, Arnold E. Greenberg and Andrew D. Eaton.
3. Gupte A. and N. Shaikh (2013): Seasonal variations in physicochemical parameters and primary productivity of Shelar lake Bhiwandi, Thane, Maharashtra. *Universal Journal of Environmental Research and Technology*, Vol.3(4): 523-530.
4. *IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS)*, Vol.10(5) : 41-45.
5. Jemi R.J. and G.S. Balasingh (2011): Physico-chemical characteristic of freshwater temple pond in kankyakumari District (South Tamilnadu), *International Journal of Geology, Earth and Environmental Sciences* ISSN: 2277-2081, vol.1(1) : 59-62.
6. Mahananda M.R., Mohanty B.P. and N.R. Behera (2010): Physico-chemical analysis of surface and ground water of Bargarh District, Orissa India, *IJRRAS*, vol 2(3) :284-295.
7. Manjare S.A., Vhanalakar S.A. and D.V. Muley (2010): Analysis of water quality using physico-chemical parameters tamdalg tank in kolhapur district, Maharashtra, *International Journal of Advanced Biotechnology and Research* ISSN 0976-2612, Vol 1(2) 115-119.
8. Sawant R. and V. Chavan (2013): Water quality status of mahagaon reservoir from gadhinglaj tahsil from maharashtra. *International Journal of Science, Environment* ISSN 2278-3687 (O) and *Technology*, Vol. 2(6) 1196–1204.
9. Shivashankar P. and G.V. Venkataramana (2007): Seasonal Fluctuations of Water Quality Parameters in Selected Points of Bhadra River, Karnataka, India. *International Journal of Innovative Research in Science, Engineering and Technology* (An ISO 3297: 2007 Certified Organization) Vol. 4(2) : 219-224.
10. Shrirame N.V., Gyananath G., Mulgir M.T. and O.S. Kanse (2014): A statistical examination of water quality of Ghagardara Pond Nanded, Maharashtra State, *International journal of scientific & technology research*, vol 3(2) : 213-219.
11. Verma S. and J.B. Khan (2015): Analysis of water quality by physico-chemical parameters in Fateh Sagar Talab in Bagar, Dist. of Jhunjhunu (Raj.) India,
12. Yadav P.P., Yadav V.K., Yadav A.K. and P.K. Khare (2013): Physico-Chemical Characteristics of a Fresh Water Pond of Orai, U. P. Central India, *Octa Journal of Biosciences*, Vol. 1(2): 177-184.

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