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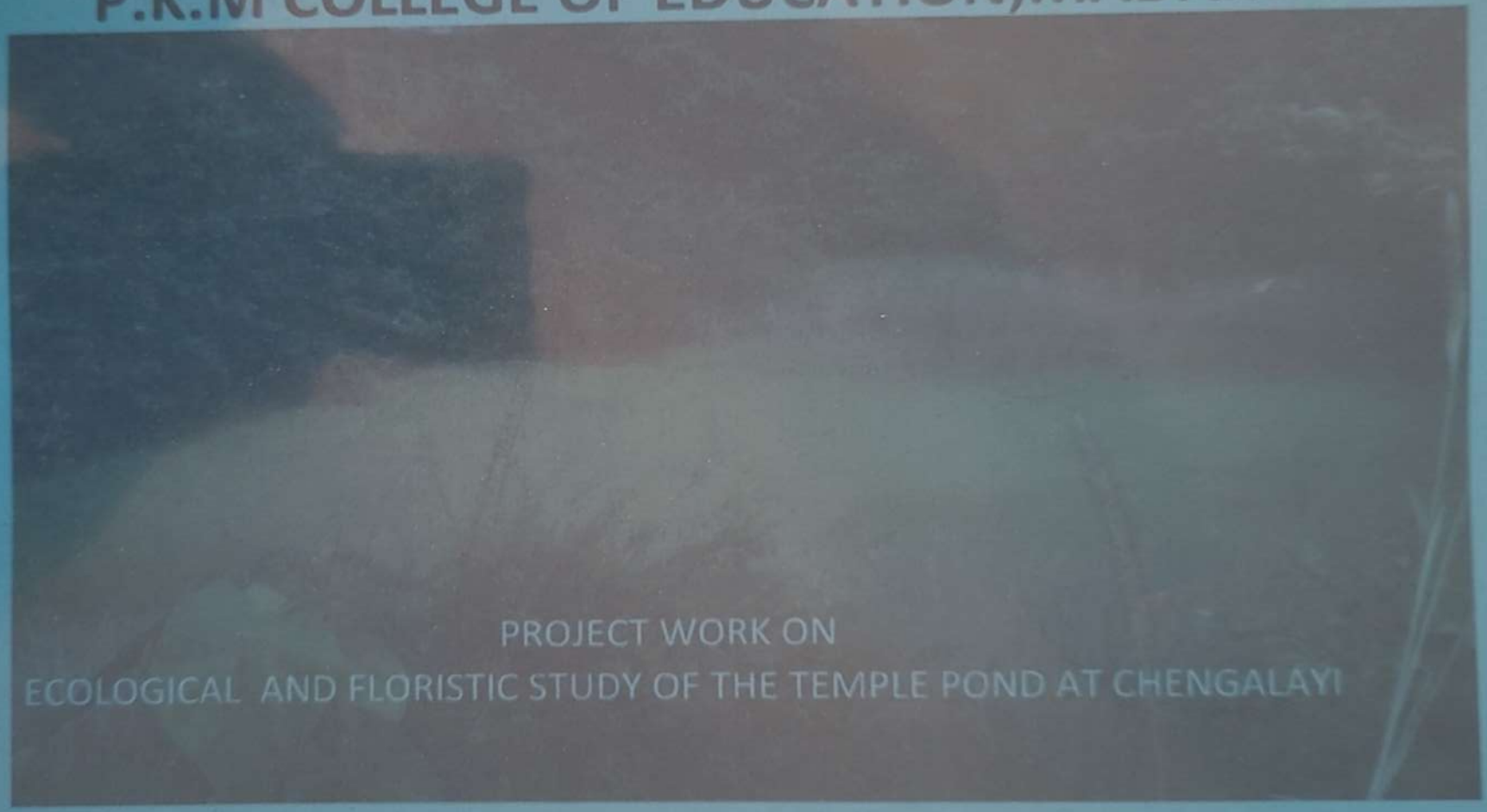

PROJECT WORK ON

ECOLOGICAL AND FLORISTIC STUDY OF THE TEMPLE POND AT CHENGALAYI

DEPARTMENT OF NATURAL SCIENCE
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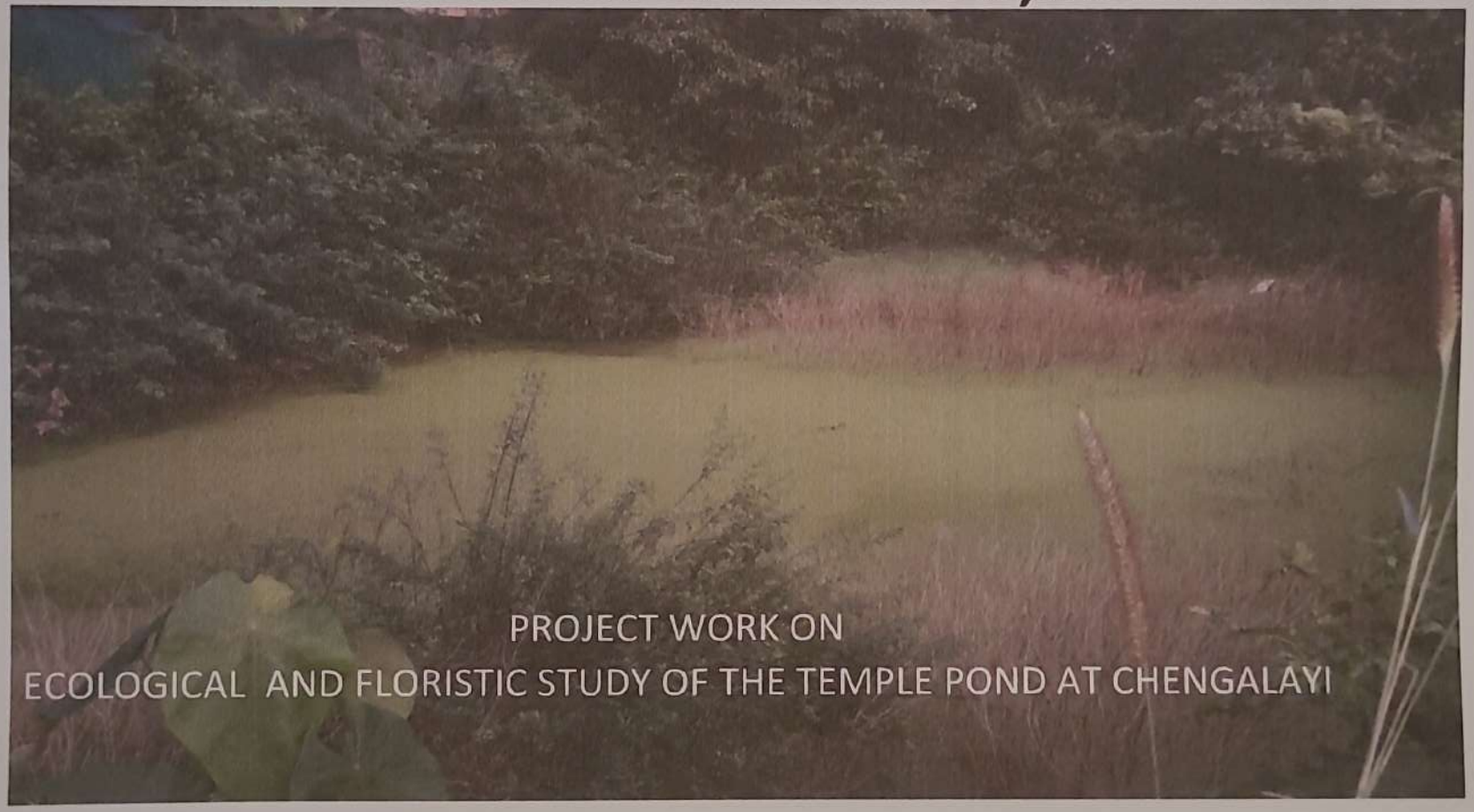

DEPARTMENT OF NATURAL SCIENCE

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CERTIFICATE

This is to certify that the project entitle **"Ecological and floristic study of temple pond at Chengalayi"** is a bonafied work carried out by the Natural Science optional students, 2018-20 batch, of P K M College of Education, Madampam under my supervision and guidance.

Mrs. Jomol Jose

Optional Teacher

Department of Natural Science

DECLARATION

This is to declare that the subject matter of this report entitled "Ecological and floristic study of the temple pond at Chengalayi" is the outcome of the project work carried out by us under the guidance and supervision of Mrs.Jomoljose optional teacher natural teacher,P.K.M college of education , Madampam.

NEETHU MADHUSOODANAN

Natural science optional student.

(2018-2020)

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We for ever beholding to our parents, and all our friends for their love, concern, and constant encouragement.

Above all, we sincerely thank the Almighty who had given us the strength during the course of the work and without whose blessings we would not have been able to complete any work successfully.

Natural science optional student

(2018-2020)

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INTRODUCTION

CHAPTER I

INTRODUCTION

Ponds are the most diverse freshwater habitats and have been recently found to support more species, as well as more uncommon, rare, and threatened species compared to lakes, rivers and streams. Traditional ponds are the blessing of nature that ensures the biodiversity and water conservation in a particular area because of the small size pond catchment areas. Kerala is well known for traditional ponds and most of them are associated with the temples and other worship places. A pond is a shallow body of water with a muddy bottom that has rooted plants growing from shore-to-shore. Because the depth is so shallow, water temperatures are fairly uniform from top to bottom but will change as air temperature fluctuates. The pond is composed of four habitats: surface film, water's edge, bottom, and open water. Pond creatures are adapted or to live in specific parts of a pond. The surface film is the habitat of many air-breathing creatures and floating plants and animals. Many animals that live on the surface film are able to walk on water because water molecules are attracted to each other and are held together by surface tension. Other organisms hang beneath the surface film. The water's edge is the richest habitat in the pond with the greatest diversity of plant and animal life. Here, organisms easily find light, cover, food and oxygen. Many emergent plants that are rooted in the bottom extend out of the water at the pond's edge. The pond's bottom is dark, low in oxygen and covered with organic debris from decaying plants and animals. Many animals burrow in the muddy bottom for warmth and protection. Bacteria that help recycle nutrients also live at the bottom of the pond. Large, free-swimming animals (turtles, birds and fish) and microscopic, floating plants live in the open water. The open water is where plants are no longer rooted in the pond's bottom. Most ponds do not

have a genuine open water zone because plants extend from shore-to-shore in shallow bodies of water. Ponds are nurseries for many insects and amphibians that hatch from eggs laid in water, and start out looking quite different from how they will appear as adults.

The pond ecosystem experiences daily, seasonal and long-term changes. Temperature varies throughout the day, dependent on the level of the sun. Oxygen levels change as well as. Even though warm water holds less oxygen than cold water, oxygen levels tend to increase during the daytime hours when plants are releasing oxygen through photosynthesis. There are many seasonal changes in a pond. Warm water is less dense (or lighter) than cold water. Water is most dense at 39.2 degrees Fahrenheit (4 degrees Celsius).

The top layer of a pond is warmer during the summer, but as the water starts to cool in the fall, the temperature at the surface begins to match the temperatures of the lower layers. As it cools to 39.2 degrees, the dense surface water sinks to the bottom of the pond. The water continues to cool until it nears freezing. At this point, the density decreases because ice is less dense than water. Fish and aquatic invertebrates swim in the warmer waters insulated by the ice. As the spring sun melts the ice, the deep, warmer water "tums over" and circulates nutrients throughout the pond. These biannual mixings are called over tums.

The biotic components of pond ecosystem are the living components which consist of, producers who are the aquatic green plants, which may be divided into microphytes and macrophytes. Consumers which are the heterotrophic organisms which consumes producers as food and they are of different levels and are;

Primary consumer which is the herbivorous animals depends on autotrophic organisms such as zooplanktons, mollusks, beetles etc. Secondary consumers are which depends on herbivorous animals for food like fishes, crabs etc. And tertiary consumers are large fishes and frogs who feed upon secondary consumers. The decomposers act on dead and decayed organic matter of plants and animals and

supply raw materials to the producers, and they are saprophytes. Pond succession is an example of a natural process that creates long-term change in a pond. A pond may fill in over -time and become a meadow and eventually a forest. When aquatic plants and animals die, they add to the decaying organic matter on the bottom of the pond. These materials start to fill in the pond, making it shallower. In addition, the decomposing organic material provides nutrients that facilitate increased plant growth. Over time, these plants die, thereby continuing the process. The pond gradually fills in to become a marsh, swamp or bog. The wetland eventually dries out as plants use up the water and add more matter to the area. In time, a forest replaces the former pond. Although succession is a natural process, humans can speed it up. When fertilizer enters a body of water via run off from lawns and farms, more plants grow, eventually die and start to fill in the water area. This excessive input of nutrients is called eutrophication. Feeding waterfowl at a pond has the same effect. Increased food supply leads to increased waste. The nutrient base in the water is enriched, plant growth increases and the pond fills in. Humans can also slow down succession by dredging ponds, cutting down trees and mowing grass.

Water quality can be evaluated using physical, chemical and biological indicators. When water is very cloudy or turbid, the sun cannot penetrate through the surface, thereby precluding plant growth. Turbid water generally has a great deal of suspended particulate matter. These materials can clog gills, which inhibit breathing in aquatic organisms. If suspended particles fall, they can cause the pond to fill in, becoming shallower over time. With decreasing depth, the water temperature begins to more closely match the air temperature. Dissolved oxygen (DO) levels are temperature dependent and vary throughout the year. Cold water retains dissolved oxygen better than warm water does. Many pond organisms have safe temperature requirements and cannot survive in warm, shallow waters with low oxygen levels. Another limiting factor is pH, which measures the percentage of

hydrogen ions in a solution. Most pond life prefers water with a pH 6.5 and 8.5. Acidic water has a pH below 7, a pH of 7 is neutral and alkaline water has a pH between 8 and 14. Acid rain lowers pH levels. Acid rain is produced when sulphur dioxide and nitrogen oxides from automobiles and factories mix with water in the atmosphere. The different organisms in water are a biological indicator of water quality. The biotic index uses aquatic animals to determine the health of a pond. Water quality is measured by classifying organisms according to their pollution tolerance. Some species can only live in clean water. The presence of these organisms is an indicator of good water quality. Biological diversity is another indicator of water quality. Diverse systems have a wide range of plants and animals. Biological diversity is important because it allows for more complex food webs and ecosystem interactions. Phytoplankton's of the pond ecosystem is of considerable ecological significance as they form basic link in food chain of all aquatic animals.

The pond which we selected for study in Changalayi is a pond having about 1. This is a water reservoir of near- by temple. This pond is ecologically and socioeconomically very important. But the condition is entirely different now due to various reasons. The ecosystem is totally collapsed and invaded by many weeds and it is very difficult to replace them. The system is biologically significant as it support rich biodiversity.

The present study mainly aims to study the ecological and floristic study of the pond as it help to its conservation. The abiotic and biotic factors controlling the system, the threats faced by the system and the conservation strategies are mainly included in our study. The role of people in conservation is also studied.

OBJECTIVES

1. To study the significance of the temple pond situated at Changalayi
2. To evaluate the different parameters of the ecosystem
3. To study the phycological flora of the pond
4. To study the floristic diversity around the pond.
5. To evaluate the threats associated with the pond.

REVIEW OF LITERATURE

CHAPTER II
REVIEW OF LITERATURE

Many workers studied about the different aspects of macrophytes in freshwater wetlands, reservoir, lakes and polluted sites. Odum (1959) suggested that although macrophytes were not used directly by the consumers, they formed very rich detritus load at the bottom and infact the best way to utilize such water bodies, when aquatic weeds were in plenty through detritus pool. Haniffa and Pandian (1978) studied the ecology of ponds with special reference to macrophytes. Singh and Srivastava (1992) gave an account of aquatic and marsh vegetation of Khagaria district and adjoining areas of Saharsa, North Bhagai pur, Begusarai and Samstipur districts of North Bihar. They collected 587 angiospermic taxa, spread over 68 genera and 35 families. The dominant families based on species number were Poaeeae, Cyperaceae, Scrophulariaceae, Acanthaceae, Asteraceae, Lythraceae, Onagraceae, Polygonaceae and Commelinaceae. The Chaurs (i.e. the place where water for a longer time after the monsoonic months) provided an excellent place for luxuriant natural growth of aquatic and marsh flora.

Analysis of H20 quality using Physico Chemical parameters in lower Manair Reservoir of Karimnagar District, Andra Pradesh by Medudhula (2012)et.al. This study was aimed to estimate current status of physico-chemical characteristic of lower Manair reservoir of Karimnagar District of Andra Pradesh. Monthly changes in physico chemical parameters such as water temperature, pH, Turbidity, Transparency, Total dissolved solids, Total hardness ,Chlorides, Phosphates ,Nitrates ,Dissolved Oxygen and Biological oxygen demand were analyzed for a period of 1 year from September 2009 to August 2010. The result indicated that Physico-chemical parameters of the water within the permissible limits and can be used for domestic, irrigation and Pisciculture .

A Data base Management System for Research in Pond Dynamics by Kevin D .Hopkins et.al. This Paper describes a Data base management system used in the analysis and synthesis of data from a global experiment investigating dynamics of Tropical Farm Ponds. Data synthesis is directed towards developing comprehensive farm pond management models. The experimental plant includes standardized data collection on Physical, chemical and biological variables on 120r more ponds at

each of 7 locations in Africa, Central America, and South East Asia. Field data from each location are compiled on micro- computers at the project site.

Physicochemical analysis of ground water taken from 5 blocks from Bihar by Neeraja kalra (2012)et.al. In Physicochemical analysis ,various quality parameters are measured including pH ,Turbidity, Electrical conductivity (EC),Total dissolved solids (TDS),Total Hardness(TH),Content of Ca ,Mg, Cl, S, Fe ,DO,BOD,COD ,Total alkalinity (TA)and nitrate concentration present in ground water also all parameters were compared with ICMR Standards of water quality ;also in present research paper classification of water samples of 5 blocks was investigation on the basis of TDS and TH. Scholars Research Library Physico-chemical and Biological parameters of paper industry effluent by S.Surumbar Kuzhali (2012) eta]. Physico-chemical and biological characteristics of paper effluent from the mills of Nilakotai Dindigul(Dt),TamliNadu ,were analyzed from Nov12 2010 to Apr 2011 in terms of p H ,colour , odour ,temperature EC,TDS, BOD, Na, Ca and Mg.All the parameters were found to be higher than the WHO prescribed discharge.

The wetlands in Kerala are currently subjected to acute pressure owing to rapid developmentalactivities and indiscriminate utilization of land and water. The major issues facing the wetlands of Kerala are mainly related to pollution, eutrophication, encroachment, reclamation, mining and biodiversity loss. Kottuli and Ashtamudi which are wetlands of National/Intemational Importance are having vital importance in this background. Ashtamudi Wetland in Kollam is an international importance wetland under the Ramsar Convention. Most of the sampling stations in the Ashtamudi and Canoli were highly contaminated with bacteriological population. Presence of organic pollution tolerant organisms also indicates the pollution load of the water bodies. An effective wastewater treatment system for treating the municipal sewage is necessary to reduce the pollution load of Ashtamudi and Kottuli wetland systems (K. Bindhya Mol.et.al 2014).

Nine sampling stations from Kerala (V eli, Neendakara, Kochi, Ponnani, Calicut, Kasaragod) and Kamataka (Mangalore, Chitrapura and Karwar) coast were selected for phytoplankton analysis. Pearson correlation analysis represented major factors affecting the distribution of phytoplankton. Kochi

sampling station recorded highest numerical density of phytoplankton followed by Mangalore. Species like Skeletonema coastatum, Asterionellajaponica, Dinophysis caudata and Chaetoceros Iorenzianii were reported from most of the stations in general and Kochi in particular. Chaetoceros curvicetus, Chaetoceros Iorenzianii, Skeletonema coastatum, Asterionella japonica, Biddulphia Sp., Nitzchia sigma, Fragilleria oceanica, Pleurosigma angulatum, Peridinium sp, Cosinodiscus gigas and Rhizosolenia setigera are the phytoplankton species (M. Ratheesh Kumar,et.al 2014).

Lake is the largest fresh water lake in Thimvananthapuram district, of Kerala. The lake water is extensively used for drinking and irrigational purposes. The lake is under the threat of pollution, encroachment and sand mining. The physico chemical parameters were analysed according to the guidelines of APHA. Dissolved oxygen, phosphate, silicate were found to be 13 higher in pre monsoon and the Biological oxygen demand was high during the monsoon period. The phytoplanktons showed abundance in the pre monsoon and had low density during the monsoon. The degree of abundance of phytoplanktons can be shown as follows.

Bacillariophyceae>Chlorpohyceae>Cyanophyceae>Euglenophyceae In certain sites the physico chemical parameters were above the desirable limits and the pollution indicator phytoplanktons like CIosterium, Nitzschia, Navicula, Oscillatoria were found and hence these sites are in the verge of pollution (T. Priya Gopinath,et.al 2014).

Planktons are the microscopic floating organisms of the surface water and moving along the direction of water current of the wetland. The phytoplankton due to its chlorophyll content able to synthesize organic food for any ecosystem (Dash, 2004). Zooplankton rely on phytoplankton for their survival and water dynamics primarily regulate their movement in spite of seme of them including larvae, nymph and beetles possess own locomotaiy organ (Pillai, 1986). The phytoplankton function as a primary producer in aquatic ecosystem and provide food for zooplankton, fish, and other heterotrophs. The zooplankton transfer the food energy from producer to the consumer level, thus occupy a transition point between die

phytoplankton and remaining consumers for the sustenance of aquatic ecosystem as well as for the benefit of human beings. Plankton are extremely vulnerable to the changes in the aquatic environment.

The variety and distribution patterns of macrophytes of inland water bodies are of current interest in studies on global biodiversity conservation. The Present attempt is to analyse the distribution pattern of macroflora of Aruvikkarara reservoir in Thiruvananthapuram District, Kerala. The study revealed the presence of 41 species of angiosperms. The dominant macrophytes such as Melastoma malabaricum, Hibiscus jilrcatus and some aquatic species like Nymphoides indica and Nelumbium speciosum were dominated throughout the water surface. From the analysis of macro flora, Malvaceae, Rubiaceae Asteraceae and Nymphyacea were the families having most number of representatives (K. Shibu Krishnan,et.al 2014).

The nutrient status and plankton dynamics of a perennial pond was investigated by Zutshi et.al. (1984) and recorded high population of blue green algae during January. Saran (1986) analyzed zooplankton communities of river Ganga system and described seasonal effects and taxa richness of three major taxonomic groups of zooplankton namely rotifers and identified twenty three taxa and found that most of them showed corresponding changes in short period varying with other hydrological parameters. Yadav (1987) found that the population densities of plankton taxa in Dhir beel showed significant month to month fluctuation with a period of maximum production in July followed by January in the first year of study. Increased numbers of phytoplankton with higher values of dissolved oxygen and the quantitative dominance of Copepods among zooplankton was a striking feature.

MATERIALS AND METHOD

CHAPTER III
MATERIALS AND METHODS

For the study we used field study and lab work. We also collected information regarding the threat posed by the pond and the role of local people in the conservation. We collected samples like water for analysis and also for phytoplankton species. The water samples were collected in polythene cans and taken into the lab for analysis. The P, TDS, temperature etc were noted from the site itself by using the portable PH meter, etc. The algal samples also taken into the laboratory for identification. The angiosperm plants identified by using the standard flora of Gamble. The vegetation analysis also conducted and frequency, density and abundance are calculated.

3.1. Vegetation analysis

Quadratic method of sampling

Quadratic method is the most conventional technique for studying terrestrial communities. It is commonly used if only a part of large area is to be sampled. On the basis of the information thus obtained, the total population of the whole area is estimated. Quadratic may be circular, rectangular or square in shape. These units are used to enclose a small area in the plot and the plants falling in it are studied. We referred Raunkier ,et,al (1934).

Quadratic method

Layout of the required number of quadrats in the ecosystem and count the presence and absence of the species.

The frequency (F) is calculated by using following formula :

F = Total number of quadrats in which a species / Total number of quadrats taken

Relative frequency is an important parameter. It is study of the dispersion of a species relative to that of species. It is calculated from the frequency data. In quadrat method as follows

RF=Number of occurance of a species/number of occurance of all species

Abundance

The relative area covered by different plant species in a small plot

Relative abundance= number of species from one group/total number of species from all groups

Density

It is the numerical strength of a species in a community in related to a definite unit area or space.

Density can be calculated by following formula

Density=Total number of individual of species in all sample plots/total number of sample plots

3.2. Water analysis

For measuring various physiological parameters we followed the method of Trivedi and Goel

3.2.1. P^H

P^H measures the hydrogen ion concentration in the water. it is measured on a log scale equal to the negative log 10 hydrogen ion concentration.

PH = -log 10(H+)

Ph =log 10 (1/H+)

A neutral solution has a Ph of 7 while a ph less than 7 renders it acidic, and ph more than 7 alkaline.

3.2.2. Dissolved oxygen

The presence of dissolved oxygen is essential to maintain the higher forms of biological life and to keep the proper balance of various populations thus making the water body healthy. The chemical and biochemical process undergoing in a water body are largely dependent upon the presence of oxygen.

Reagents:

A. Sodium thiosulphate 0.025N - Dissolve 24.82g of N328203.5H20 in a pre-boiled distilled water and make up the volume to 1 litre. Add a pellet of NaOH as a stabilizer. This is 0.l stock solution. Dilute it 4 times to prepare 0.025N solution). Keep in a brown glass bottle.

B. Alkaline potassium iodide solution Dissolve100gofKOHand50gofK1in200mlofpreboileadIStiHedwater.

C. Manganous sulphate solution Dissolve100gof MnSO4.4H20 in 200ml of distilled water and heat to dissolve maximum salt; filter after cooling.

D. Starch solution Dissolve lg of starch in 100mldistilledwater,warm for complete dissociation.

E. Conc. Sulphuric acid Procedure: Fill the sample in a glass toppered bottle of known size (100-300 ml).

Care should be taken to avoid any kinds of bubbling and trapping of the air bubble after placing the stopper. Add l ml of eachMn804 and alkaline Kl solutions well below the surface through the walls separate pipettes for these 2 reagents. A brown precipitate will appear indicating the presence of oxygen. Shake the contents well by repeatedly inverting the bottle and keep for some time to settle down the precipitate. In case the precipitate is not setting properly, again shake the contents and keep. If the titration is to be prolonged for few days, the sample can be stored at this stage with the precipitate. Add 2ml of concentrated H2S04 and shake well to dissolve the precipitate. Remove either the whole contents or part of them (50 — 100ml) in a conical flask for titration, avoiding any further mixing of oxygen through bubbling. Titrate the contents, within one hour of dissolution of the precipitate with sodium thiosulphate solutions using a few drops of starch as an indicator. At the end point, the initial dark blue-black colour changes to colourless.

When the whole contents have been titrated:

Dissolved oxygen, mg/l = (ml*N)of sodium thiosulphate*8*1000/V1-V

When only a part of the contents has been titrated:

Dissolved oxygen, mg/l =

(ml*N) of sodium thiosulphate*8*1000/V2[(V1-V)V1]

V1=Volume of sample bottle

V2=volume of contents titrated

V=Volume of MnSO4 &KI (2ml)

3.2.3. Total alkalinity, carbonates and bicarbonates:

Alkalinity of the water is its capacity to neutralize an acid and is characterized by the presence of all hydroxyl ion capable of combining with the hydrogen ion. Alkalinity in natural waters is due to free hydroxyl ions and hydrolysis of salts formed by weak acids and bases such carbonates and bicarbonates.

POH is the measure of the alkalinity of a solution. So basically it measures the hydroxide ion in a solution. It is the opposite of PH on the 0-14 scale because it says that a POH of 14 is a strong base.

POH = 14-PH

RESULTS AND DISCUSSION

CHAPTER IV
RESULTS AND DISCUSSIONS

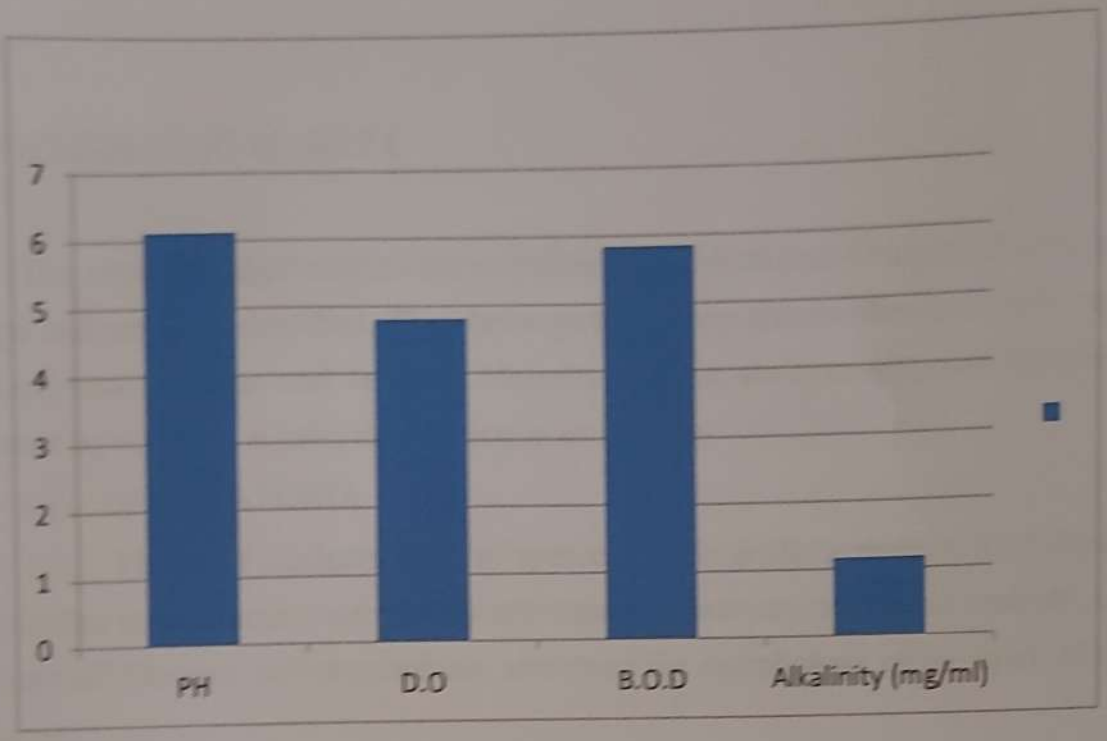
4.1. WATER ANALYSIS

The environmental parameter showed wide variations as per the topography and the geo setting of the ecosystem.

PARAMETERS	SITE 1	SITE 2	SITE 3
pH	6	6.2	6.3
DO	4.46	4.96	5.24
BOD	5.8	5.82	5.9
Alkalinity(mg/ml)	1.2	1.1	1.2

Table 1

The pH value range between 6 – 6.3.The salinity is very less. DO is found to be medium level.



Graph 1

4.2. PHYCOLOGICAL DATA

The results of algal studies are as follows. We identified 10 algae of different groups and many unidentified. They belongs to various groups like chlorophyceae, cyanophyceae, diatoms and desmids. Majority of them are cyanophycean members followed by diatoms. A brief description is as follows-

4.2.1. OSCILLATORIA

The chief characteristics of species in this genus is their lack of sheath and another is their active oscillatory movement. These are numerous species , on the basis of diameter, cell proportions and upon the morphology of the apex of the trichome.

4.2.2. SPIROGYRA

This is the most commonly found members of the entire order of zygnematales. Spirogyra forms green clouds of cottony growth usually in quite water. Rarely filaments are attached by short rhizoidal branches, when in the reproductive stage the plant appear at the surface of water, form cottony mats and become brown/dirty coloured as the plants loss there green colout and form zygospores. Conjugation may be lateral or scalariforms.

4.2.3. PINNULARIA

These are mostly naviculoid with broadly rounded poles in valve view. The conspicuous feature is the prominent transverse coaste on either side of relatively wide straight axial field. The raphae in this field is sigmoid . in girdle view the frustules are rectangular with truncate poles.

4.2.4. PEDIASTRUM

These can be mainly identified by the plate like arrangement of cells. In some species plate is continuous where as in others there are interstices and fenestrations. Commonly the cellsat the margin differ in shape from those within. Pediastrum cell walls are highly resistant to decay and nany species are found in fossils or semi fossils condition.

4.2.5. ZYGNEMA

They are seen as freely floating . It's body is filamentous. They consist of elongated barrel shaped cells, with star shaped chloroplast.

4.2.6. LINGBYA

Most species are straight and rigid or sometimes curved and entangled. Some species are entangled among other algae and ocassionly epiphytic, but many are planktonic. The definite rather form sheath extending beyond the end of the trichome ids characteristic and and helps to separate this genus from oscillatoria.

4.2.7. OEDEGONIUM

They are having filamentous body. Filaments are attached end to end forming uniserate row. It has three cell that is basal cell which is long and which helps in fixation. Apical cell which is usually rounded. And middle cell which are rectangular shaped.

4.2.8. BACTRACOSPERMUM

These are filamentous with elongated cylindrical cells.

4.2.9. NITELLA

It is a filamentous algae with long cells. They are having bushy appearance.

4.2.10. CHLADOPHORA

Their body is branched filaments. Usually they are found in attached condition. Their branching is always lateral. Cell's are elongated and are arranged to end to end. There is a large vacuole. The chloroplast is seen at peripheral region.

SL .NO	ALGAE	DIVISION
1	OSCILLATORIA	CYANOPHYCEAE
2	SPIROGYRA	CHLOROPHYCEAE
3	PINNULARIA	BACILLARIOPHYCEAE
4	PEDIASTRUM	CHLOROPHYCEAE
5	ZYGNEMA	ZYGNEMATACEAE
6	LYNGBYA	CYANOPHYCEAE
7	OEDEGONIUM	CHLOROPHYCEAE
8	BACTROCTROSPERMUM	RODOPHYCEAE
9	NITELLA	CHLOROPHYCEAE
10	CHLADOPHORA	CLOROPHYCEAE

Table 2

4.3. VEGETATION ANALYSIS

The result of vegetation analysis was given in the table. Most dominant species are *Alterananthera* since it has the highest value of 20.Least dominant species are *Mangifera* since it has the lowest value of 0.4.This indicates that *Alterananthera* is most abundant in our study area than the other species.*Alterananthera* occurred in maximum number in all quadrats.Its frequency,density and abundance are very high while compared to other species. The frequency, abundance and density of various species are given in table-3. It is represented in figure;

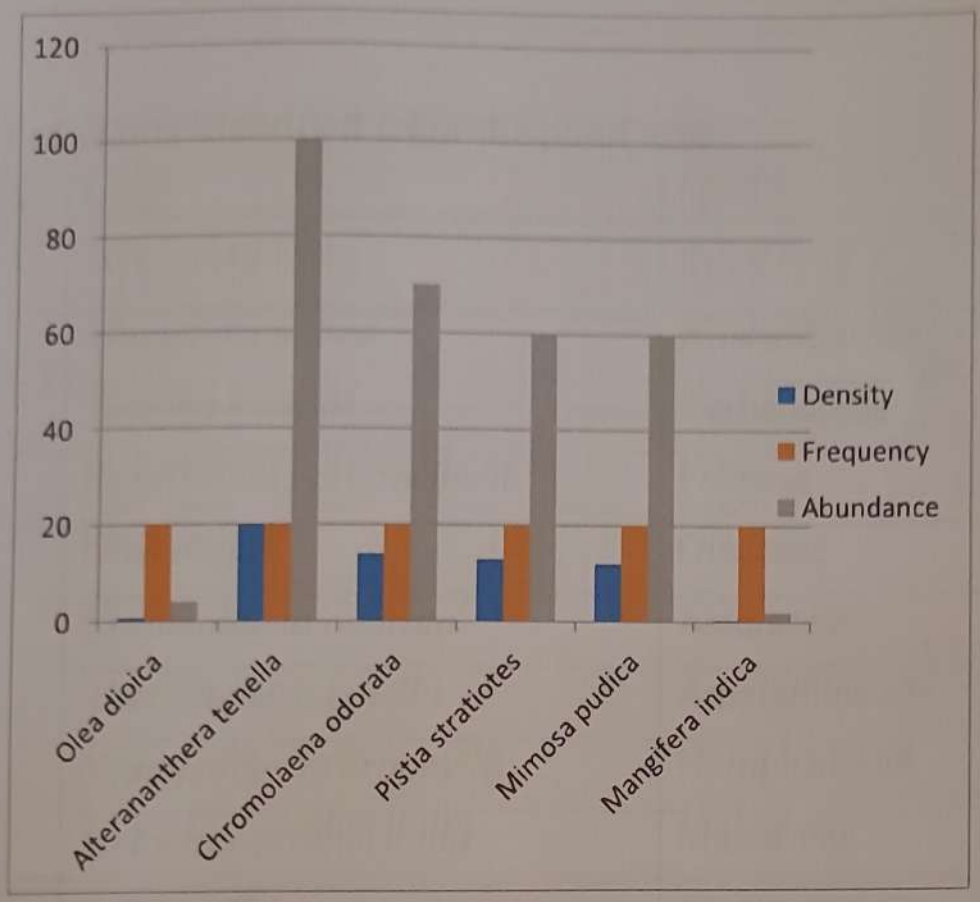
Sl. No.	Name of species	D	F	Ab
1	*Olea dioica*	0.8	20	4.0
2	*Alternanthera tenella*	20	20	100
3	*Chromolaena odorata*	14	20	70
4	*Pistia stratiotes*	13	20	60
5	*Mimosa pudica*	12	20	60
6	*Mangifera indica*	0.4	20	2.0

Table 3

D: Density F: Frequency Ab: Abundance

Most abundant species *Alterananthera* with the value : 100

Most density species *Alterananthera* with the value : 20.


120
100
80
60
40
20
0
Density
Frequency
Abundance
Olea dioica
Alterananthera tenella
Chromolaena odorata
Pistia stratiotes
Mimosa pudica
Mangifera indica

Graph 2

List of plants identified from the pond area

Sl. No.	Name	Familiy
1	*Mitracarpus hirtus*	Rubiaceae
2	*Mangifera indica*	Anacardiaceae
3	*Tectona grandis*	Verbenaceae
4	*Pennisetum polystachyon*	Poaceae
5	*Olea dioica*	Oleaceae
6	*Chromolaena odorata*	Asteraceae
7	*Alternanthera tenella*	Amaranthaceae
8	*Nymphoides hydrophylla*	Nympheaceae
9	*Melochia corchorifolia*	Malvaceae
10	*Eclipta alba*	Asteraceae
11	*Aerva lantana*	Amaranthaceae
12	*Pistia stratiotes*	Salviniaceae
13	*Mimosa pudica*	Mimosaceae
14	*Acacia auriculiformis*	Mimosaceae
15	*Cleome viscosa*	Capparidaceae

Table 4

Chromolaena odorata

Alteranantherа tenella

Olea dioica

Pistia stratiotes

Melochia corchorifolia

Nymphoides hydrophylla

4.4. Threats to Pond Ecosystem

- Improper handling of pond.
- Dumping of waste – People dump their bio degradable and non bio degradable waste in the pond surroundings.
- Introduction of invasive species – Native species has been replaced by Chromolaena.
- Change in land use pattern results in the reduction of pond size.

CONCLUSION

CHAPTER V
CONCLUSION

From our studies it is clear that pond is enriched with different species. The system is more productive as it contains different types of algae and flora. The pond is now facing various threats for existence, even though it is a temple pond it is not maintained properly .Various invasive species like Chromolaena creating for other species.

As PH value range between 6 - 6.3, Salinity is very less. Due to excessive amount of algal bloom, BOD is very high. Thus it indicates high degree of water pollution. So the amount of Dissolved oxygen level is very less. To conclude that this will harmfully affect the life of other organisms and Phytoplankton is pond.

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