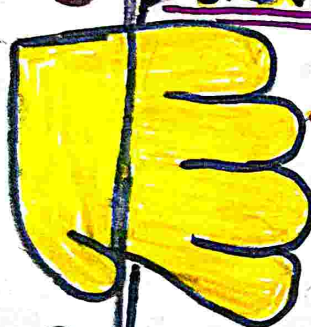
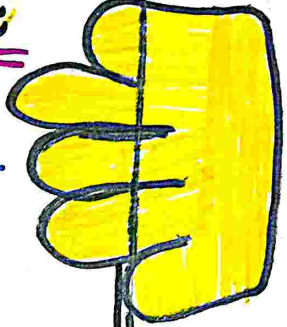


KAZI NAZRUL UNIVERSITY  
RANIGANJ GIRLS COLLEGE



NAME: ~ SWETA SINGH  
CLASS: ~ B.A (SEMESTER-I)



SUB: ~ E.V.S

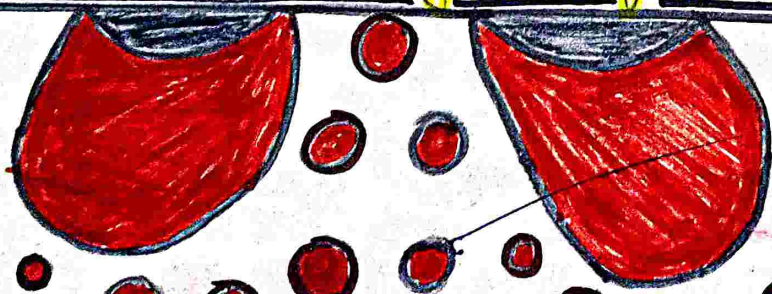
ROLL: ~ 432

SESSION: ~ 2021-22

PROJECT

SUBMITTED TO: ~ MOUMITA PAL  
MAM.

*Signature of the teacher.*



## **Raniganj Girls' College**

**Course Name: Environment Studies**

**Course Code: AEE101**

**Topic of the project: Water pollution**

### **A Project Report**

**Submitted by Semester-I students (Academic Year 2021-22)**

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## CERTIFICATE

This is to certify that this project titled “Water pollution” submitted by the students for the award of degree of B.A. Honours/ Program is a bonafide record of work carried out under my guidance and supervision.

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Place: Raniganj

*Mousmita Pal*

Date: 18.03.2022

Assistant Professor, Department of Zoology

Signature of the supervisor with designation and department

# Kazi Nazrul University

Asansol West Bengal - 713340



## REGISTRATION CERTIFICATE

This is to certify that **SWETA SINGH**

Son/Daughter of **DILIP KUMAR SINGH**  
of **RANIGANJ GIRLS' COLLEGE**

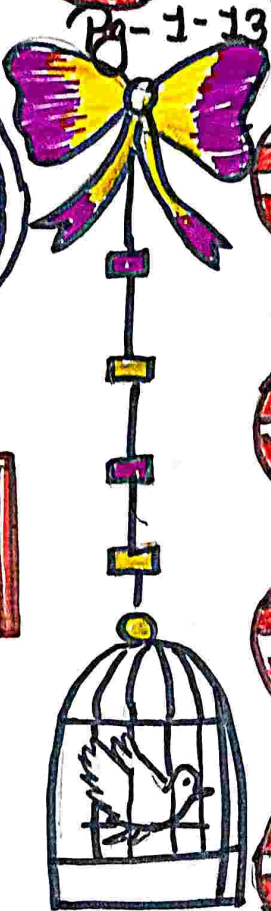
is registered as a student of this University,

His/Her registration number is 113211210247 of 2021-22



Registrar

18-1-13



# INDEX

Topic - Water

Pollution

in

Raniganj City

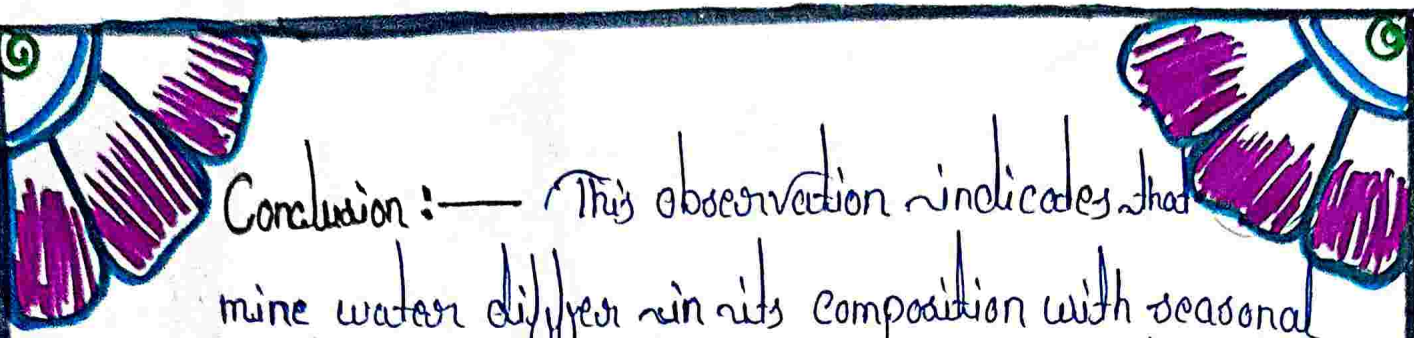


## ABSTRACT

**Aim:** — The aim of the study was to monitor the water quality of ten pit lakes which were located in Ranigum coal field area, West Bengal for three successive seasons January 2020 to February 2021.

**Methodology:** — In this study physicochemical parameters of water sample were analyzed following standard method statistical analyses were used to indicated the role of each parameter.

**Result:** — Significant positive correlation was noted within in hardness and chloride the nature of the pit lakes is generally alkaline. ~~PH~~ A mean value of PH 7.65 were recorded which ranged between 6.70 and 9.10 during the study period significant variation found among other parameters of pit lakes. PCA reveals three most important and key influential parameters hardness chloride and nitrate nitrogen content of pit lake water.




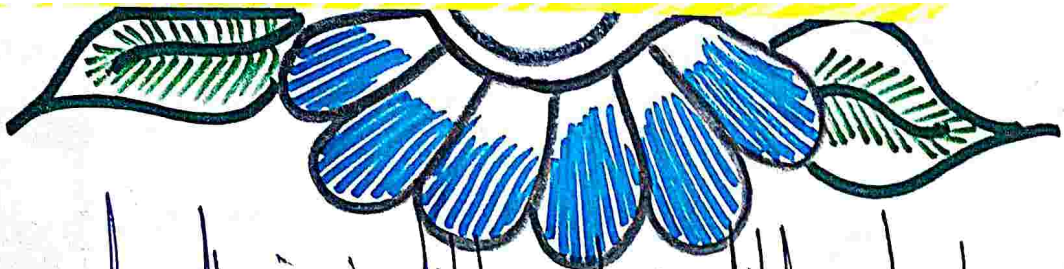
**Conclusion:** — This observation indicates that mine water differs in its composition with seasonal changes and having capability to change their nature with time.

**Key words:** — water quality pit lakes, Ranigang coalfield physico-chemical characters.

### INTRODUCTION

The opencast coal extraction method is one of the best and appropriate in the mining industries of India resulting into a void or pit which is eventually filled up by surface runoff and ground water seepage becoming a pit lake, the potential water reservoir in India, coal is a major resource and important primary source of energy. Coal mining activities changes drastically different sectors of our environment. The major environmental impacts on the surrounding areas and on human health are well documented.





by several authors in different in different times (Dhar, 1993, Ripley et al, 1996, Peoples and Edmonds, 2002, Younger 2004, Paley et al 2003)

Pit lakes have unique physical property than other water body.

Nevertheless, pit lake waters often constitute a vast resource but of limited beneficial use (due to water quality issues); with a potential to contaminate regional surface and ground water resources.

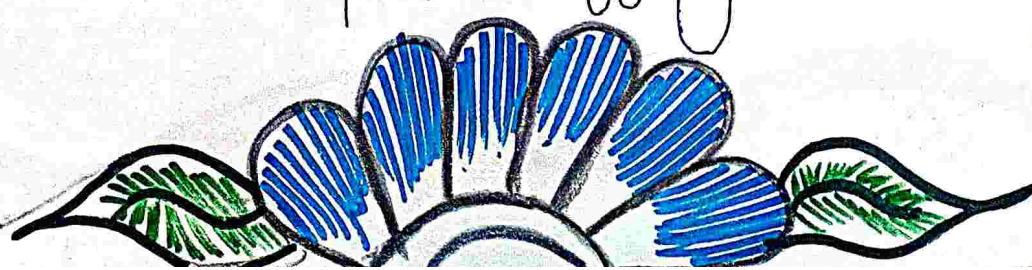
Their value as resources for recreation, fisheries,

water supply and wild life habitat depends mostly on

their topography. Their safety pit lake may have long-term benefits area water source for industrial activities

rather than relying on natural systems. Several records were available on the assessment of the water quality of different pit lakes in India.

Thus quality assessments of selected pit lakes in RCF has been carried out during 2014, 2015 in order to assess the present hydrological conditions, bio-product and efficiency to evaluate strategies






an ecological restoration, conservation and  
Management.

## MATERIALS AND METHODS

Study area : — Raniganj coalfield is the birth place of coal mining in the country. Area of Raniganj coalfield is  $4530 \text{ km}^2$  spreading over Burdwan, Birbhum, Bankura and Purulia Districts in West Bengal and Dhanbad District in Jharkhand. Heart of Raniganj coalfield (RCF) is however, in Burdwan District bounded by Jyoti River in the North and Damodar River in South on the basis of geographic distribution and use pattern 10 pit lakes were selected for studying the physico-chemical properties of their water selected for studying the post-monsoon, comprising the three principal seasons of a year.








Solid Waste :— The improper disposal of solid waste is a major source of water pollution.

Solid waste includes garbage, rubbish etc., atomic waste, trash, and construction and demolition waste, all of which are generated by individual, residential, commercial institutional and industrial activities. The problem is especially acute in developing countries that may lack infrastructure or resources or regulation to unit improper disposal. In some places solid waste is intentionally dumped into bodies of water. Land pollution in inland bodies of water can also eventually make their way to the ocean.

Solid waste pollution is unightly and damaging to the health of aquatic ecosystems and can harm wild life directly. Many solid wastes, such as plastics and electronics waste, break down and leach harmful chemicals into the water, making them a source of toxic or hazardous waste.




**Toxic waste** : — Waste is considered toxic if it is poisonous, radioactive, explosive, carcinogenic (causing cancer), mutagenic (causing damage to chromosomes), teratogenic (causing birth defects or bio accumulative (that is increasing in concentration at the higher ends of food chains) source of toxic chemicals include improperly dispose of waste water from industrial plants and chemical process facilities (lead, mercury, chromium) as well

**Types and sources of water pollutants** : — Water bodies can be polluted by a wide variety of substances, including pathogenic microorganisms, putrescible organic waste, fertilizers and plant nutrients, toxic chemicals, sediments, and petroleum-oil and radioactive substance several types of water pollution are considered below. (For a discuss of the handling of coverage and other forms of waste produced by human activities see waste disposal and solid-waste management.)

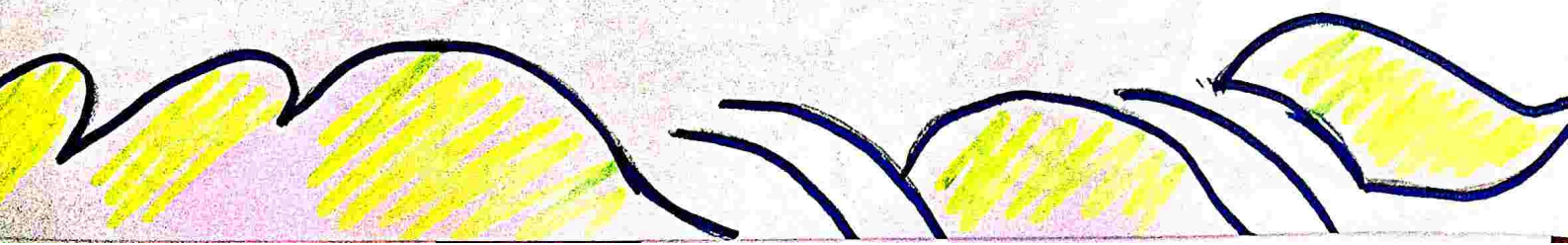
Water pollutants come from either point sources or ~~disposal~~<sup>erosal</sup> sources. A point source is a pipe or channel, such as those used for discharge from and ~~street~~ industrial facility or a city sewerage system. A dispersed (nonpoint) source is a very broad unconfined area from which a variety of pollutants enter the water body. such as the run off from an agricultural area. point sources of water pollution are easier to control than disposal sources because the contaminated water has been collected and conveyed to one single point where it can be treated. pollution from disposal sources is difficult to control. continue to cause a large fraction of water pollution problems.

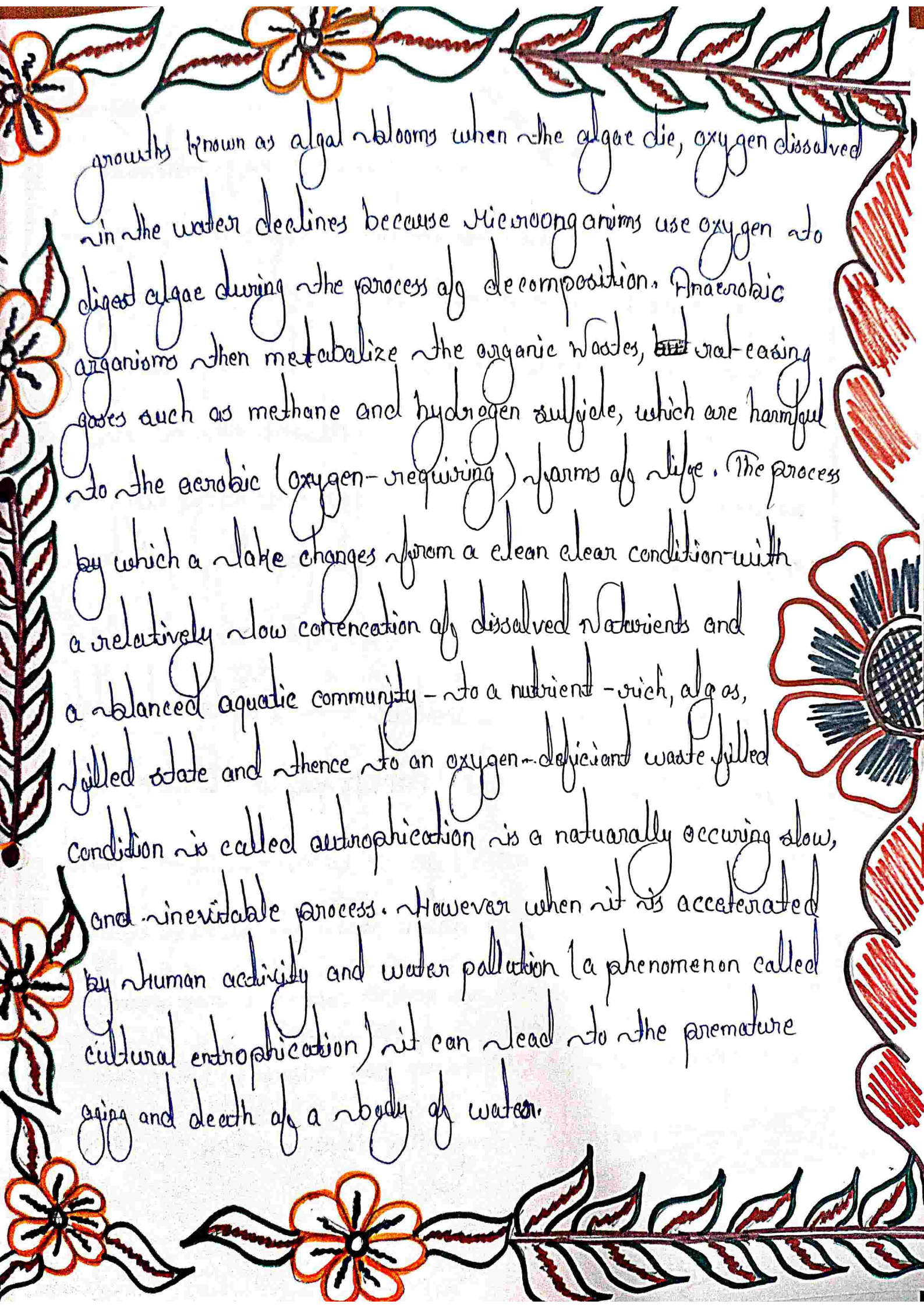
**Domestic sewage:** — Domestic sewage is the primary source of pathogens and putrescible organic substances because pathogens are excreted in feces, all sewage from cities and towns is likely to contain pathogens of some type, potentially presenting a direct threat to public health. putrescible organic matter presents a different hazard in the sewage as by bacteria and other microorganisms, the dissolved



oxygen content of the water is depleted. This endangers the quality of lakes and streams, where high levels of oxygen are required for fish and other aquatic organisms ~~to survive~~. Sewage treatment processes reduce the levels as surface runoff containing pesticides used on agricultural areas and suburban lawns (chlordane, dieldrin, heptachlor) (for a more detailed treatment of toxic chemicals see poison and toxic waste.)

Sediment : — Sediment resulting from soil erosion or construction activity can be carried into water bodies by surface runoff. Suspended sediment interferes with the penetration of sunlight and upsets the ecological balance of a body of water. Also, it can disrupt the reproductive cycle of fish and other forms of life, and when it settles out of suspension it can smother bottom dwelling organisms.





growths known as algal blooms when the algae die, oxygen dissolved in the water declines because microorganisms use oxygen to digest algae during the process of decomposition. Anaerobic organisms then metabolize the organic wastes, ~~but~~ releasing gases such as methane and hydrogen sulfide, which are harmful to the aerobic (oxygen-requiring) forms of life. The process by which a lake changes from a clean clear condition with a relatively low concentration of dissolved nutrients and a balanced aquatic community - to a nutrient-rich, algae-filled state and thence to an oxygen-deficient waste-filled condition is called eutrophication is a naturally occurring slow, and inevitable process. However when it is accelerated by human activity and water pollution (a phenomenon called cultural eutrophication) it can lead to the premature aging and death of a body of water.

Water sample analysis: — Water samples were collected from 10 pit lakes in premonsoon, mono-~~using standard~~ soon and post-monsoon season during 2021-2022 using standard protocols and guidelines. The value of each parameter was expressed as mean with standard deviations in the results.

Tests for physicochemical parameters of water sample were performed by following standard methods given by American public Health Association (APHA, 2005) and Black (1965).

Statistical analysis: — Statistical analysis were performed using the statistical Package XLSTAT (Addinsoft 2010) where are drawn using  $\alpha = 0.05$  (Benkart et al. 2014) of pathogens and organics in waste water but they do not eliminate them completely. Domestic sewage is also a major source of plants nutrients, mainly nitrates and phosphates. Excess nitrates and phosphates in water promote the growth of algae, sometimes causing an algal bloom and rapid.



**DISCUSSION:** — Variation of physicochemical parameters of lakes of Ranigang found with their mean value. Similar findings were also reported by PCA reveals three most important and key influential become lake water parameter are positively correlated that indicate their effort on water quality hierarchical cluster - respect to their physicochemical parameter. These may be due to the site specific complex hydrological and biological interactions which naturally occur in these ecosystems.

**CONCLUSION:** — Based on the result of present studies of the lake of Ranigang area it can be concluded that water quality show a prominent change in their quality. It revealed that all parameters changes with seasonal variation. Such changes were found in pH, conductivity, Alkalinity, Hardness, chloride nitrate nitrogen and phosphate also.

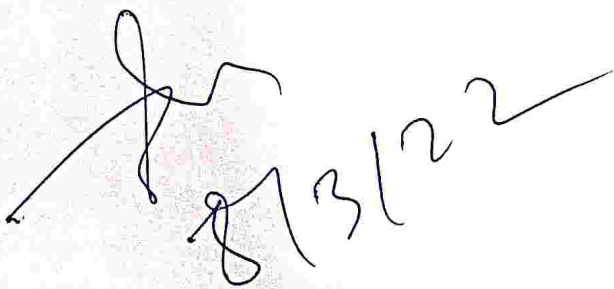


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All girls college Teacher's Mem's.

Thanks  
you



27/3/22

