KAZI NAZRUL UNIVERSITY

RANIGANJ GIRL'S COLLEGE

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CLASS - B.A (SEMESTER- I)

SUB - E.V.S

ROLL - 545

PROJECT SESSION :— 2021-2022

SUBMITTED TO :— MOUMITA PAL MAM

# 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

Date: 18.03.2022

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Signature of the supervisor with designation and department

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## REGISTRATION CERTIFICATE

*This is to certify that* APSANA KHATUN

*Son/Daughter of* NASIRUDDIN MIA

*of* RANIGANJ GIRLS' COLLEGE

*is registered as a student of this University,*

*His/Her registration number is* 113211210241 *of* 2021-22

Registrar

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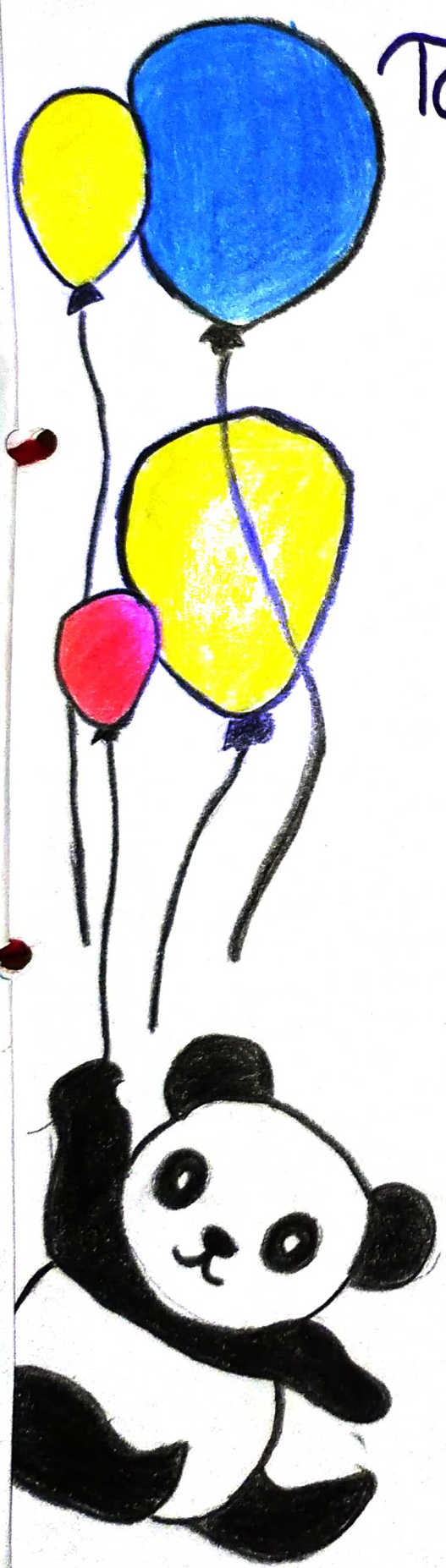
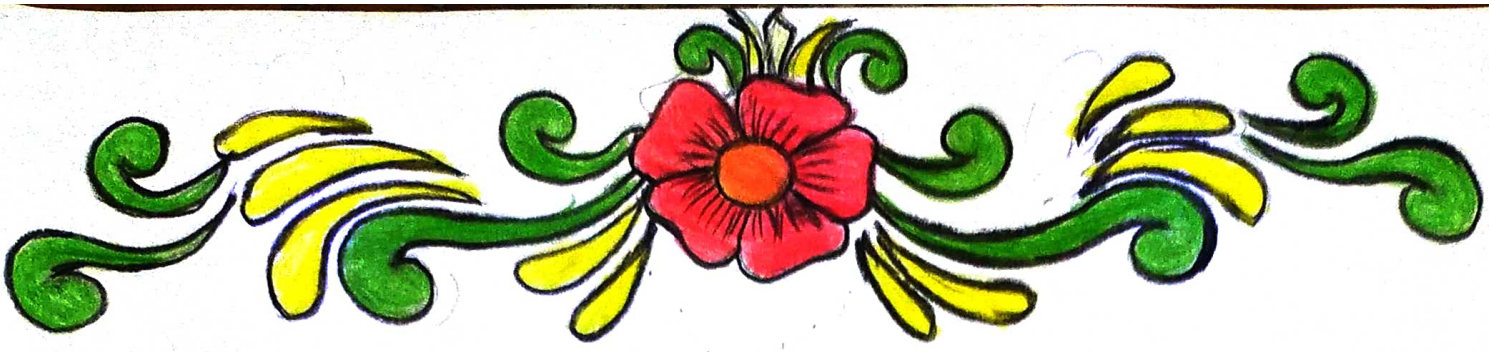


## Topic : Water Pollution in Ranigaonj City



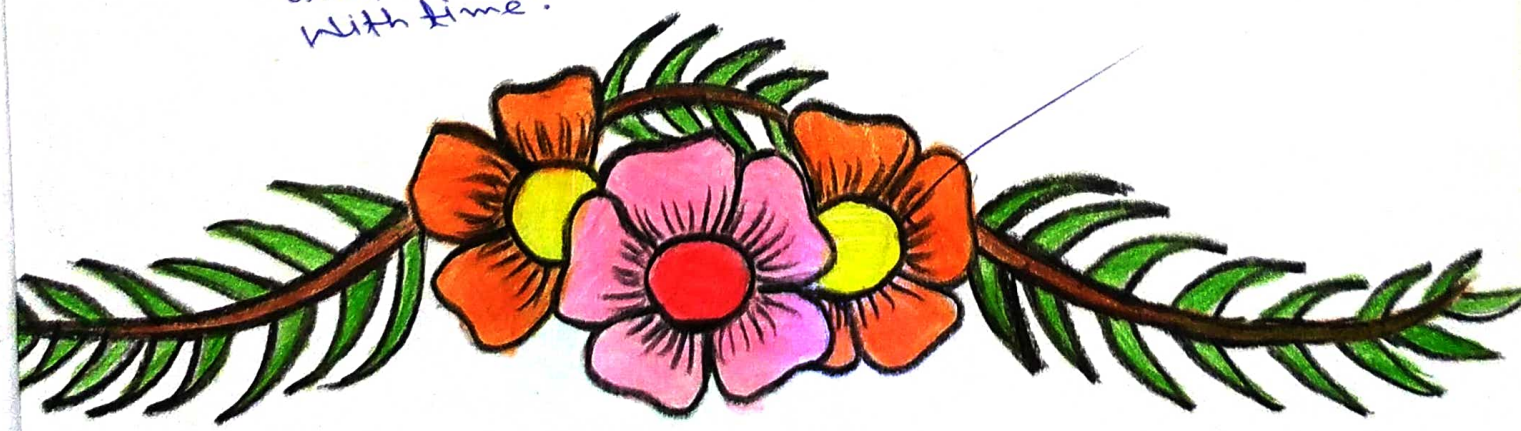
# ABSTRACT


**Aim** :- The aim of the study was to Monitor the Water quality of ten pitlakes which were located in Raniganj coal fieldarea, 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 hardness and chloride. The Nature of the pitlakes is generally alkaline. 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 pitlakes. PCA reveals three most important and key influential parameters Hardness, chloride and Nitrate Nitrogen content of pitlake Water.

**conclusion** :- This observation indicates that mine Water differ in its composition with seasonal charges and having capability to change their nature with time.

Key Words :- Water quality pitlakes, Raniganj coal field, physico-chemical characters.

## INTRODUCTION

The opencast coal extraction Method in 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 reservior in India, coal is a major resource and most important primary source of energy. Coal Mining ativites changes drastically different sectors of our environment. The Major environmental impacts on the surrounding areas and on human health are well documented by Serveral author's in different times (Dhar, 1993; Ripley et al, 1996; Peplow and Edmonds, 2002, younger 2004, Pal et al. 2003)

pit lakes have unique physical property than other Wates body. Nevertheless, pit lake Waters often constitute a vast resource but of limited beneficial use (due to Water quality issures); With a potential to contaminate regional surface and ground Wates resources. Their value as resources for recreation, fisheries, Water suffely and Wild life habital depends Mostly on their topography, their safety pit lake may have long-term benefits as a Water source for 'industrial activities rather than relying on natural systems Several records were available on the assessment of the Water quality of different pitlakes 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-profile and efficacy to evolve stratagies for an ecological restoration, conservation and Management.

# MATERIALS AND METHODS

**Study area** :- Raniganj coalfield in the birth place of coal Mining in the country. Area of Raniganj coalfield in 1530 $km^2$ spreading over Burdwan, Birbhum, Bankura, and purulia Districts in West Bengal and Dhanbad District in Jharkhand Heart of Raniganj coal field (RCF) is however, in Burdwan District bounded by Ajoy River in the North and Damodar River in South on the basic of geographic distribution and use pattern 10 pitlakes Were selected for studying the physico-chemical properties of their Water selected for studying the post-monsoon, comprising the three pricipal seasons of a year.

**Water sample analysis** :- Water samples Were collected from 10 pitlakes in premonsoon, Monosoon 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 parameter of water sample Were performed by following standard Methods given by American public Health Association (APHA, 2005) and Black (1965)

**Statistical analysis** :- Statistical anylyses Were performed using the statistical package XL STAT (Addinosoft, 2010) v1 raphs are drawn using sci DAvis 1.D005 (Benkert et. al. 2014)

**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 plants nutrients, toxic chemicals, sediments, heat, petroleum (oil), and radioactive substances. several types of Water pollutants are considered below. (For a discussion of the handling of sewage and other forms of waste produced by human activities see Waste disposal and solid-Waste Management.)

Water pollutants come form either point sources or dispersed sources. A point source is a pipe or channel, such as those used for discharge from and industrial facility or a city sewerage system. A dispersed (or 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 agricltural area. point sources of Water pollution are easier to control than dispersed sources, because the contaminated Water has been collected and conveyed to one single point where it can be treated. pollution from dispersed 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 paces, 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 Naturally in the sewage by bacteria and other microoganisms, 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

tronic Waste, thrash, 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 contries that may lack infrastructure to resources or regulation to limit improper disposal. In some places solid Waste in intentionally dumped into bodies of Waters. Land pollution can also become Water pollution if the trash or other debris is carried by animals, Wind, or rainfall to bodies of Water. significant amounts of solid Waste pollution in inland bodies of Waters can also eventually make their Way to to the ocean. Solid Waste pollution is unsightly and damaging to the health of aquatic esosystems and can harm Wildlife directly. Many solid Wastes, such as plastics and electronic 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 bioaccumulative (that is, increasing in concentration at the higher ends of food chains) source of toxic chemicals include improperly disposed Waste Waters form industrial plants and chemical process facilities (lead, Mercury, chromium) as Well

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 unusually dense and rapid growth the 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, 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 Naturients and a blanced aquatic community - to a nutrient-rich, algae-filled state and thence to an oxygen-deficient Watse filled condition is called eutrophication, is a Naturally occurring slow, and inevitable process. However When it is accelerated by Human activity and Wates pollution (a phenomenon called cultural eutrophication) it can lead to the premature aging and death of a body of Wates.

Solid Waste :- The improper disposal of solid Waste is a major source of Wates pollution. Solid Waste includes grobage, rubbish, elec

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 run off. 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 stelles out of supension it can smother bottom-dewlling organisms.

**Thermal pollution** :- Heat is considered to be a Water pollutant because it decreases the capacity of Water to hold dissolved oxygen in solution, and it increases the rate of metabolism of fish. valuable species of game fish cannot survive in Waters With very low levels of dissolved oxygen. A major source of heat is the parctice of discharging colling Waters from power plants into rivers; the discharged Waters may be as much as 15°C (27°F) Warmer than the Naturally occurring Waters. the rise in Water temperatures because of global Warming can also be considered a form of thermal pollution.

**aquifer** :- The process of saltwater intrusion into a coastal aquifer depends on how much Water has been removed from the fresh waters aquifer. Aquifers Whose Waters are periodically recharged are able to keep salt Waters from intruding.

**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 influencial parameters - Hardness, chloride and Nitrate Nitrogen content of lake Waters. parameters are positively correlated that indicate their effect 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 Waters quality show a prominent change in their quality. It revaled that all pit lakes changes with seasonal variation. such changes were found in pH, Conductivity, Alkalinity, Hardness, chloride, Nitrate Nitrogen and phosphate phosphorus also. Major factors indicate that lake Waters quality have the potentiality to improve and restore its self with due course of time.

# ACKNOWLEDGEMENT

Authors express their deep sense of gratitude to Department of science and technology Government of West bengal for financial support. Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The Authors are also grateful to authors/editors/publishers of all those articles, Journals and book from where the literature for this article has been reviewed and discussed. It was his/her All girls college teacher's & Mam's

Thank's you