Department of Geography

Field Survey 2023-2024

NOTICE

It is hereby informed to all the students of 6th semester 2021-22 that Field Survey at Kunustoria Colliery area and Residential area will be held on 18.03.2024. All the students are asked to present at the spot by 8.00 A.M.

Dated- 14/03/2024

Coordinator of the Department
Geography Department
Bidhan Chandra College

We the under signed, students of Department of Geography, do hereby declared that we are willingly going to the departmental excursion at Ranchi on 24-09-2023 to 28-09-2023. We also declared that we will obey the rules and regulations of the college.

20/06/2024 11:57

पश्चिमबङ्ग पश्चिम बंगाल WEST BENGAL 84AB 276410

Sl. No.	Name of the Student	Signature	Guardian's phone
1	ANISH GHOSH	Anish Ghosh	8927484924
2	MD SAQUIB IQBAL ANSARI	md saquib iqbal ansari	6295350445
3	MRINMOY KUNDU	Mrinmoy Kundu	9832861092
4	PRADIP KUMAR KARMAKAR	Pradip Kumar Karmakar	9735179482
5	SWARNADEEP SAHA	Swarnadeep Saha	6295103699
6	ARNAB SARKHEL	Arnab Sarkhel	7797580014
7	SABYASACHI MONDAL	Sabyasachi mondal	9734789532
8	ANIRBAN DAS	Anirban Das	9733062421
9	KIRAN CHAND	Kiran chand	9046787873
10	SOUMEN GHOSH	Soumen Ghosh	9932651171
11	HEMANTA MURMU	Hemanta murmu	9732008379
12	AMARJEET SHAW	Amarjeet Shaw	9064450576
13	KRISHNENDU SENGUPTA	Krishnendu Sengupta	8617528203
14	ARIJIT MONDAL	Arijit Mondal	7679874553
15	PAPIYA DAS	Papiya Das	7098765476
16	Pratikhya Banerjee	Pratikhya Banerjee	9641728569
17	Sangita Barick	Sangita Barick	9832937280
18	RANI MAJI	Rani Maji	8637559050
19	SANA NAZIBA	Sana Naziba	8538805242

ক্রমিক নং 1554 তারিখ 6/9/23

পত্র- 10

নাম A Dey

ঠিকানা

স্বাক্ষর শ্রী

Sl. No.	Name of the student	Your Phone No.	Guardian's Phone No.
20	OEISHI NEOGI		9932885882
21	SNIGDHA BHATTACHARYA		9734287478
22	Mousita Banerjee		9732162718
23	PUJA PAUL		8670876857
24	Mausumi Murmu	Mousumi Murmu	9635320952
25	Sharmila Sonapasri		9564509481
26	Khushi Gond		8436774148
27			
28			

Bidhan Chandra College

NAAC Accredited, [Govt. Sponsored], ESTD: 1961
Recognized by U.G.C (Govt. of India) and affiliated to Kazi Nazrul University
Asansol – 713304, Dist – Paschim Bardhaman , West Bengal , Ph : 0341-2283020
Visit us: www.bccollegeasansol.ac.in; E. Mail: bccollege.office@gmail.com

CERTIFICATE FROM THE SUPERVISER

This is to certify that Miss Sana Naziba, Reg No-103211220040 has completed this project on "Mining as Human induced Disaster: A case study of Kunustoria Colliery" under my supervision for her 6th semester in Geography from Bidhan Chandra College, Asansol Under the Kazi Nazrul University.

It is also certified that the said Project has incorporated the result of the investigation made by Miss Sana. This work is based on both secondary and primary data.

Sougata Maji

Sougata Maji
Geography Department
Bidhan Chandra College

Principal,
Bidhan Chandra College,
Asansol, West Bengal,

Principal
Bidhan Chandra College
Asansol

BIDHAN CHANDRA COLLEGE ESTD - 1961 Govt Sponsored ASANSOL

21/08/2024 13:40

BIDHAN CHANDRA COLLEGE

KAZINAZRULUNIVERSITY

B.SC 6TH SEMESTER

TOPIC:- MINING AS A HUMAN INDUCED DISASTER : A CASE STUDYOFKUNUSTURIACOLLERY

COURSE NAME:- **DISASTER MANAGEMENT PROJECT**

WORKCOURSECODE:-**BSCHGEOC602**

DISCIPLINE:- **B.SC IN GEOGRAPHY HONS.**

REGISTRATION NO – **103211220040**

ROLL NO- **1032106122018030**

SEMESTER:- **VI**

SESSION : - **2023-2024**

A CASE STUDY

OF

KUNUSTORIA COLLIERY SURVEY

DEPARTMENT OF GEOGRAPHY

BIDHAN CHANDRA COLLEGE

(ASANSOL)

ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my professor Mr. Sougata Maji who gave me the golden opportunity to do this assignment on "MINING AS A HUMANINDUCED DISASTER : A CASE STUDY OF KUNUSTURIA COLLERY".

Secondly I would like to express my special thanks to our principle Dr. Falguni Mukhopadhyay for providing me all the necessities.

CONTENT

MINING AS A HUMAN INDUCED DISASTER : A CASE STUDY OF KUNUSTURIA COLLERY

➢ ABSTRACT:

There are generally hazards associated with working in many industries. Mining industry has been always ranked among the ones that have the most dangerous working environments. Underground mining is a highly dangerous and hostile environment and there are several factors regarding this issue. It is, therefore, important to create a safe workplace that reduces these challenges so that mining can sustain. In this paper, the safety issues related to mining industry is discussed. Then, a risk matrix is developed to define the importance of these factors and their impact on the industry. Finally, the most important elements are explained and somesolutions to solve them are presented.

➢ INTRODUCTION :

Mining is a hazardous operation and consists of considerable environmental, health and safety risk to mine. Unsafe conditions in mines lead to a number of accidents are cause loss and injury to human lives, damage to property, interruption in production etc. But the hazards cannot be completely obliterated and thus there is a need to define and reckon with an accident risk le possible to be presented in either quantitative or qualitative way. Safety is paramount in the mining environment. The mining industry has for many years focused on injury prevention at the workplace through procedures and training, and has achieved considerable success. However, the statis on major accident events such as fatalities and reportable incidents has not shown the corresponding level improvement, In the area of major hazards control, the mining industry approach has emphasized mainly on p experiences and lessons learnt, while other high hazard industries such as the chemical process industry and o gas industry have taken system safety techniques to new highs.

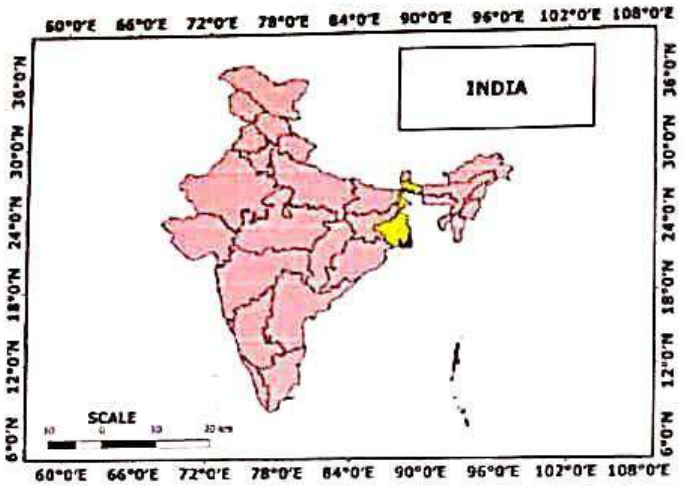
➢ STUDY AREA :

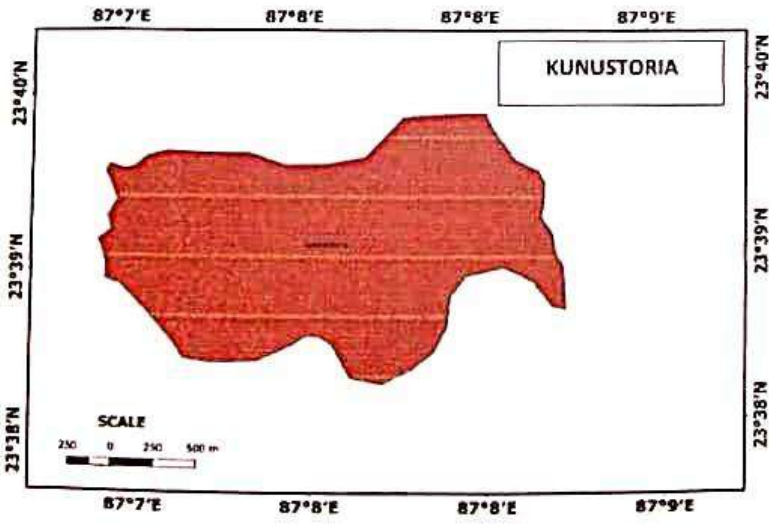
The Raniganj coalfield lies in the easternmost part of the Damodar Valley Coalfield and is bounded by 23°25'N to 23°50'N latitude and 86°38'E to 87°20'E longitude. It covers about 1,530 km² geographical area, spreading over the Burdwan, Birbhum, Bankura, and Purulia districts in West Bengal and Dhanbad district in Jharkhand. A network of roads and railway branches link the area with other part of the country (Fig. 1). The topography of the Raniganj coalfield is gently undulating and the elevation generally ranges from 65 to 75 m above sea level. The highest elevations are the Panchet (643 m) and Biharinath hills (451 m). The drainage pattern is mainly dendritic to sub-dentritic in nature (Srivastava and Mitra 1995) and most mines of this coalfield lies between two rivers, the Damodar and Ajay which flows almost parallel to each other. The area is a tropical region with fairly temperature variation.

The Raniganj coalfield is a part of the Gondwana Supergroup, which extends here over a rectangular area greater than 1,000 km². A full succession of lower Gondwana and younger rocks occurs, attaining a maximum thickness of more than 3,200 m. A large part of the coal- field is occupied by coal-bearing horizons of the Barakar and Raniganj Formations. A fluvio-lacustrine coal barren sequence known as the Iron Stone Shale separates these two coal-bearing horizons. The Panchet Formation (also barren of coal) overlies the Raniganj Formation, and comprises feldspathic sandstone and red clays.

The Raniganj coalfield is surrounded by Archaean rocks on all sides except in the east, where its boundary is not clear, as it is covered by alluvium. The dip of the strata is generally southerly; the oldest rocks are exposed along the northern margin, and successively younger strata outcrop towards the south. The northern margin represents the normal depositional boundary between the basal Gondwana and the basement Archaeans while the western and southern boundaries are faulted.

KUNUSTORIA COLLIERY





➢ Objectives of Studying Mining as a Human-Induced Disaster:

1. Understanding Environmental Impacts.

2.Assessing Health and Safety Risks.

3.Evaluating Socio-Economic Consequences.

4.Promoting Sustainable Practices.

6.Policy and Governance.

7.Sustainable Solutions.

➢ METHODOLOGY :

The method used in this research to evaluate and analyse the risk of a coal mine was quantitative method. Quantitative risk matrix is increasingly applied in the mining and minerals industry due to business requirements to support financial decisions, evenly compare financial risks with environmental and social risks, and to demonstrate transparency, consistency and logic of approach. However quantitative risk matrix approaches often are not intuitive and require some up-front learning investment by decision makers.

In his article 'What's Wrong with Risk Matrices? Tony Cox argues that risk matrices experience several problematic mathematical features making it harder to assess risks. These are:-

a. **Poor Resolution:** Typical risk matrices can correctly and unambiguously compare only a small fraction (e.g., less than 10%) of randomly selected pairs of hazards. They can assign identical ratings to quantitatively very different risks ("range compression").

b. **Errors:** Risk matrices can mistakenly assign higher qualitative ratings to quantitatively smaller risks. For
risks with negatively correlated frequencies and severities, they can be "worse than useless," leading to worse-than-random decisions.

c. **Suboptimal Resource Allocation:** Effective allocation of resources to risk-reducing counter measures cannot be based on the categories provided by risk matrices.

d. **Ambiguous Inputs and Outputs:** Categorizations of severity cannot be made objectively for uncertain consequences. Inputs to risk matrices (e.g., frequency and severity categorizations) and resulting outputs (i.e., risk ratings) require subjective interpretation, and different users may obtain opposite ratings of the same quantitative risks. These limitations suggest that risk matrices should be used with caution, and only with careful explanations of embedded judgments. (Mutekede, 2014).

➢ TYPES OF HAZARDS ASSOCIATED WITH MINING :

On the basis of different hazard associated with mining these can be differentiated into two major categories, which are as follows:-

❖ PHYSICAL PROBLEMS:-

Coal mining is associated with a range of physical problems that impact both miners and the surrounding environment. Here are some of the primary issues: Health Risks for Miners

1. Respiratory Diseases:

- Coal Workers' Pneumoconiosis (CWP)*: Also known as black lung disease, this condition is caused by long-term inhalation of coal dust, leading to lung damage.
- Silicosis*: This occurs due to inhaling silica dust, which can be present in mining environments.
- Chronic Obstructive Pulmonary Disease (COPD)*: Long-term exposure to dust can lead to chronic bronchitis and emphysema.

2. **Hearing Loss:** Prolonged exposure to the high noise levels from mining equipment can cause hearing damage.

3. **Musculoskeletal Disorders:** The physical demands of mining, such as lifting, carrying, and operating heavy machinery, can lead to back injuries, joint problems, and other musculoskeletal issues.

4. **Traumatic Injuries:** Miners face risks from cave-ins, explosions, machinery accidents, and falls, leading to severe injuries or fatalities.

❖ ENVIRONMENTAL AND COMMUNITY HEALTH PROBLEMS:

1. **Water Contamination**: Mining activities can lead to the contamination of water sources with heavy metals, acid mine drainage, and other pollutants, impacting drinking water and aquatic ecosystems.

2. **Air Pollution:** The release of coal dust and other particulates into the air can affect the respiratory health of communities near mining sites.

3. **Land Subsidence:** The collapse of land over mined areas can damage infrastructure, homes, and natural landscapes.

❖ Environmental Impacts:

1. **Habitat Destruction:** The removal of large areas of land for mining disrupts habitats and can lead to the loss of biodiversity.

2. **Greenhouse Gas Emissions:** Coal mining and combustion are major sources of carbon dioxide (CO_2) and methane (CH_4), contributing significantly to global warming and climate change.

3. **Waste Management:** The extraction process generates large amounts of waste rock and tailings, which need to be managed to avoid environmental contamination.

Addressing these problems requires stringent safety regulations, environmental protections, and ongoing health monitoring for workers. Efforts to reduce coal dependency and transition to cleaner energy sources are also critical in mitigating these issues.

➢ RESULTS AND DISCUSSION:

From the data collected from the direct survey at Kunustoria Mining Area office the followed Graphical representation of the primary data has been represented along with the discussion. That will help us to know about the problems faced by the local residents of that area that how coal mining effects their daily life.

(Fig.1)

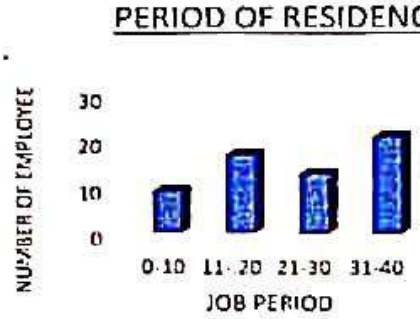
From the above graphical representation it can be esiliy observed that the maximum residents and employee of the Kunustoria mining area is belongs to the age group of 51-60 yrs including the under -ground miners. Whereas the lowest age group belongs to that area is 20-30yrs who the mainly the family members of the employed persons.

From the survey it has also been observed that the population male and female is fairly distributed in that area but most of the mining activities are done by the male population ,whereas the females are mostly engaged in normal office errands. The working sex ratio of male and females are represented in (fig.2). most of the working persons are engaged in underground mining activates which quite dangerous work even there is safety measures provided by the coal mining authority like shoes, helmets, and lights, hospital facilities, but even though there is chance of being stuck in underground due to blasting and land slides.there are also some surface and other works which are conducted in above the ground surface. But even the surface workers have to suffer from the hazardous impacts of mining activites .(fig.3).

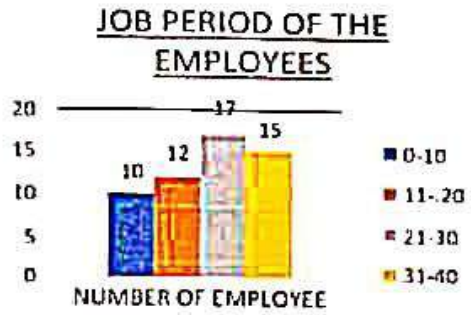
(Fig.2)

(Fig.3)

The hazardous effect of coal mining can be best observed by the long term residents of that area.as per result of the kunustoria survey the most of the surveyed person residing for 31-40yrs (fig.4)of and served ECL for around 21-30yrs (fig.5) whom many persons weather it could be themselves or their family member suffering from many coal mining induced diseases like heart issues, dust allergy, cough, headache, asthma, high Bp (due to blasting).whereas the underground miners also have to go through several disease due to they have to face some toxic gases in the underground mining gas chambers.

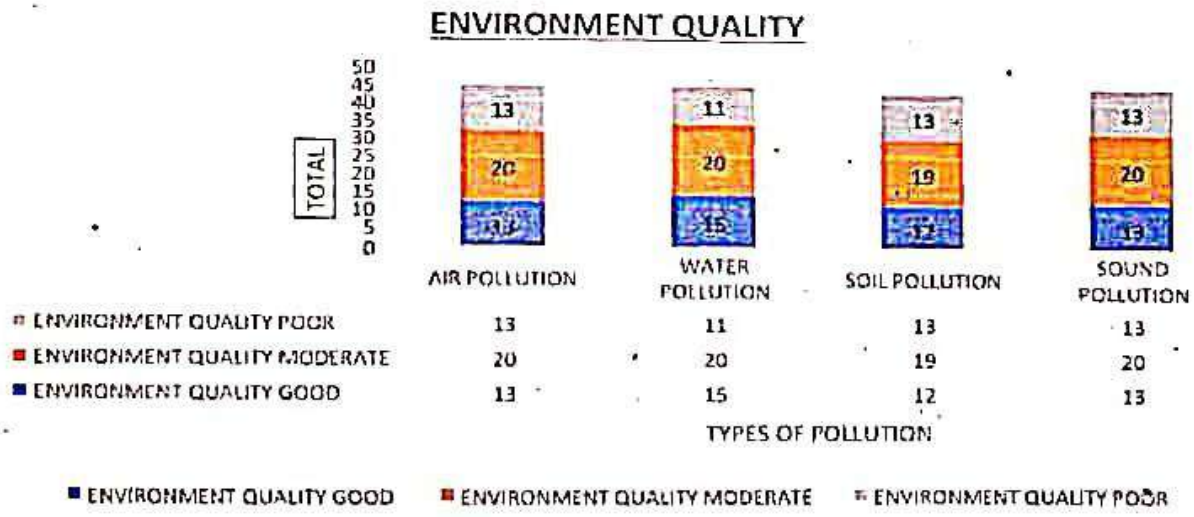


(Fig.4)



(Fig.5)

Coal mining not onlyimpacts the humans daily life but also the environment which again impacts human life directly. coal mining effects nature in various by degrading the of air weather it is underground or opencast mining by releasing many toxic gases, land and soil degradation by blasting in the mines, mining activities also impacts the surrounding water bodies by polluting them and in many other ways this mining activities impacts the surround nature and as well as the ecosystem of that area in and hazardous way. Regarding this bad impacts of mining a graphical representation of



that surveyed data collected from Kunustoria can has been represented in fig.6.

Fig.6

◆Mitigation and Management Strategies:

To address the adverse impacts of mining at Kunustoria, several strategies can be implemented.

1. **Environmental Management:** Implementing stringent environmental regulations to control pollution, managing waste, and reclaiming mined land can mitigate environmental impacts. Regular monitoring and enforcement of standards are crucial.

2**. Health and Safety**

Measures: Improving working conditions, providing proper safety equipment, and conducting regular health check-ups can reduce health risks. Training programs for workers on safety practices and emergency response are essential.

3. **Community Engagement:** Involving local communities in decision- making processes and ensuring fair compensation and rehabilitation for displaced families can help alleviate socio-economic tensions. Transparent communication and corporate social responsibility initiatives can build trust and cooperation between mining companies and local residents.

➢ CONCLUSION:-

The study of mining in Kunustoria highlights the dual nature of coal mining as both an economic driver and a source of significant human-induced disaster. Addressing the environmental, health, and socio-economic impacts requires a balanced approach that includes sustainable mining practices, robust regulatory frameworks, and active community engagement. By implementing these strategies, it is possible to mitigate the negative effects of mining and promote a more sustainable and equitable development path for the region.The insights gained from Kunustoria can serve as a valuable reference for other mining regions facing similar challenges, emphasizing the importance of holistic and integrated approaches to managing natural resources responsibly.