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**DEPARTMENT OF GEOGRAPHY
BARASAT GOVERNMENT COLLEGE**

2022-23

GEO SPHERE





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ABOUT THE DEPARTMENT

The cultural heritage of Barasat is very rich and the light of the Bengal Renaissance has also touched its soil. Bankim Chandra Chatterjee, the renowned author and composer of the National Song of India, was the first Indian Deputy Magistrate of this town. Stalwarts like Ishwar Chandra Vidyasagar, Peary Charan Sarkar, and Kalikrishna Mitra were known for undertaking several social reformative actions in Barasat, including the development of education, especially women's education. A direct result of these events was the setting up of the first private school for girls in Bengal in 1847 by Kalikrishna Mitra with the help of Peary Charan Sarkar. Barasat Government College inherits this glorious cultural past. However, the College owes its birth to a historical disaster - the partition of Bengal and the consequent deluge of displaced people into a border state. A substantial section of the uprooted masses depended on formal education for their very subsistence and in 1950 the State Government selected the town of Barasat as the location for a new college.

The Department of Geography of Barasat Government College was established in the year 1996 for teaching Honours course under the University of Calcutta, later affiliated to West Bengal State University since 2008. The teachers are competent to teach different branches of Geography including Geographical Information System and Remote Sensing.



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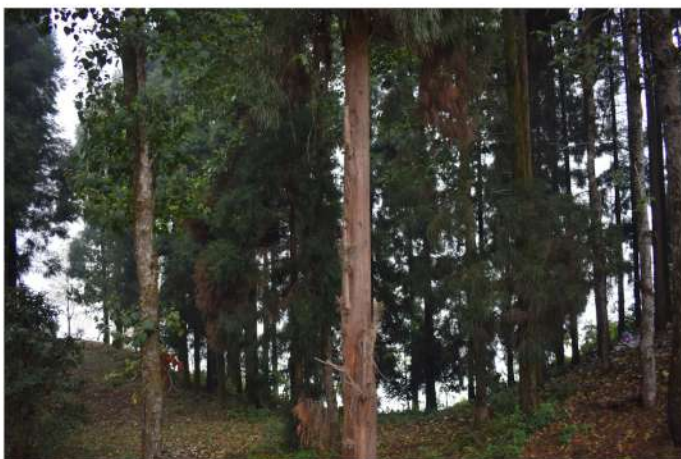
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PREFACE

It is a great pleasure to present the departmental magazine “GEOSPHERE” for the academic session 2022-23. Like the previous two volumes this year again we are publishing the magazine in electronic mode. With lots of effort finally, students are able to complete their long-awaited departmental publication.

I would like to congratulate all faculty members of our department for their valuable contribution to giving this magazine a perfect shape and publishing it within the timeline.

Dr. Ruksanara Begum
Head
Department of Geography



BARASAT: BECOMING A DUMPING GROUND

Indrani Paul

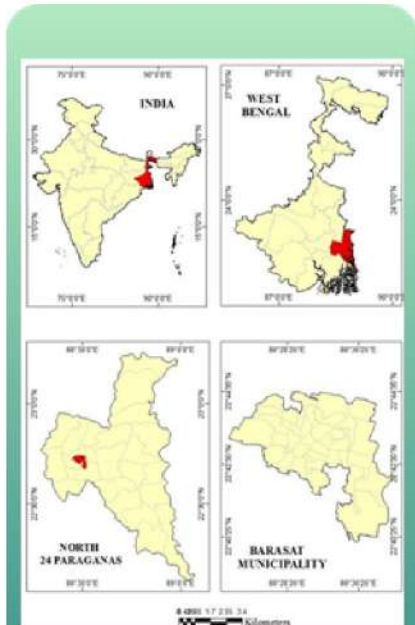
Semester: VI

INTRODUCTION:-

Barasat is a city and a municipality of North 24 Parganas district in the Indian state of West Bengal. It is the headquarters of Barasat Sadar subdivision. It is a part of the area covered by Kolkata Metropolitan Development Authority (Barasat Municipality, 2022).

The local government of Barasat has many environmental issues, the most notable of which are water logging, drainage system, traffic problems, road transport etc. But I am concerned about the waste management in Barasat. Because even though the government has taken steps for the remaining problems, but no such step has been taken for waste management; even if steps are taken, it is temporary.

Waste is any substance which is discarded after primary use, or is worthless, defective and of no use. If proper management of these wastes is not taken in time, the amount of the waste will increase day by day, which later caused various problems. Similarly, the Barasat Municipality has not taken appropriate action in time, which is causing problems at present.



Mukherjee, 2018

CONDITION OF WASTE MANAGEMENT IN BARASAT:-

- The people of Barasat complain that the condition of the city is getting worse day by day. Regular garbage is not being removed from their house. Municipal garbage trucks come 2 days or 1 day in a week (Anandabazar Patrika, 2021). As a result, the citizens are facing problems. So they are being forced to dump the wastes besides the road, pond or drain.
- Due to lack of proper dumping ground, garbage is being piled up outside of Barasat stadium, Hospital, fire brigade, school-college and other populated areas; which is polluting the city environment and obstructing the road movement of the people (ABP News, 2022).
- The condition of the markets are more deplorable. There are also piles of garbage everywhere. Suranjan Biswas, a resident of Hatkhola area, said: city cleaners used to collect garbage from the houses everyday. But now it is irregular. Garbage can't keep longer at home. As a result, we are throwing garbage wherever we can. I don't know when the situation will be normal!

GARBAGE HEAPS IN DIFFERENT PLACES OF BARASAT:-



THE STEPS TAKEN BY THE GOVT. :-

- Many years ago some steps were taken by the municipality regarding waste management. For example, degradable & non-degradable waste collect separately and spread public awareness But it was not stable more than a week (Barasat Municipality, 2022).
- waste of 35 wards of Barasat municipality was dumped in an area under Kadamgachhi panchayat. As the amount of garbage increased day by day; the local people had to face various problems. The villagers had complained ; the waste was being dumped in the surrounding farms; so the crops were being damaged (Niyogi & Chakraborty, 2021). The stench was spreading with that. The villagers demanded to remove the dumping ground. They started movement against Barasat municipality (2021). Their main message was "Vat Hatao Jeevan Bachao." So the Barasat municipality was forced to stop dumping. Now Barasat municipality has no any proper dumping ground. So garbage are piled everywhere. Municipality doesn't follow environment friendly waste management rules (Anandabazar Patrika, 2021).
- They are burning the plastics and other materials which increases air pollution. They are not able to manage the pathology waste, so it is increasing various diseases (ETV Bharat, 2023). Lack of the proper waste management the garbage and plastic bags jam the drains and increases water logging problem and also increases mosquito borne diseases (malaria and dengue).



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THE STEPS GOVT. SHOULD TAKE:-

- environment friendly sustainable waste management rules.
- Execute the 3r (recycle, reduce, reuse) rules in waste management.
- Arrange proper dumping ground away from the residential area .
- Stop burning the solid wastes(plastic, furniture and other materials).
- Appoint staffs to collect garbage from house, market and other places on a daily basis.



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A CASE STUDY OF THE MASSIVE LANDSLIDE AT DARJEELING, 2022

Dhruba Adhikari (2045056) Sounak Dubey(2045005) Kartick Kangsabanik (2045015) Gopa Biswas (2045061)
Sem- VI

"Something that is dangerous and likely to cause damage"

- Cambridge English Dictionary

When hazards stay for long and became worse it make a Disaster.

Landslide as a disaster,

A landslide is defined as the movement of a mass of rock, debris or Earth down a slope. Landslides are a type of "MASS WASTING".

Mostly it happens during the monsoon season of JUNE to OCTOBER.

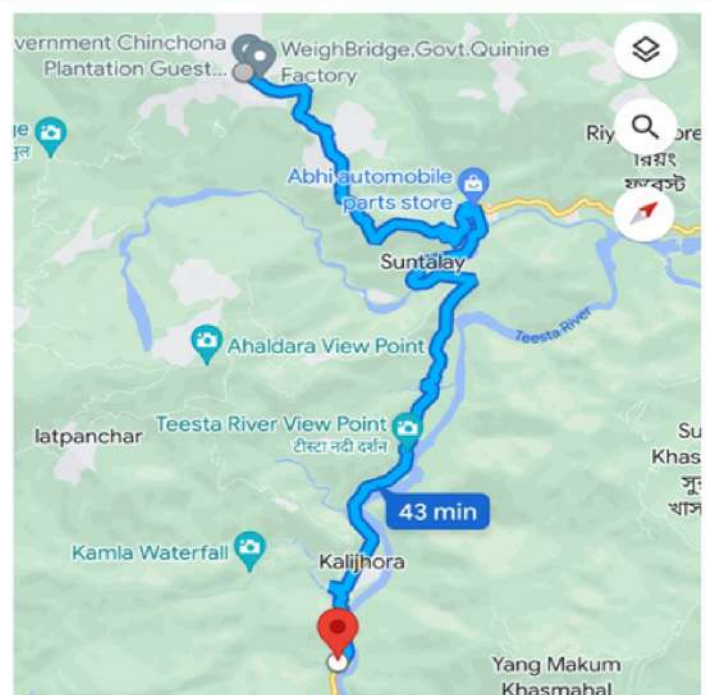


OBJECTIVES

- * Study the occurrence of landslides
- * Know more about the structural components of Darjeeling hills.
- * Identify the causes of landslides.
- * Assess the critical areas and impact of landslides.
- * Increase awareness among public.
- * Suggest necessary measures to mitigate disasters.
- * To know how far "The Queen of Hills" for the visitors as one of the safest tourist spot.

Study Area

The NH-10 near Mungpoo Fatak (Kalimpong) and Andheri Jhora (Darjeeling)



FACTORS , TRIGGERING LANDSLIDES

Unscientific Construction
 be it roads or building have increased the landslides. Many local people point out that the many structures are being constructed without any scientific aspects. (e.g. Hill slope cutting)

Heavy rainfall
 increases the number of frequencies of landslides . That's why we observed most of the landslides happening in between June and July.

Landslides are also caused by the earthquake shock. The tremor generated by the earthquake can disturb the underlying structures of the hilly region.



Others
 Deforestation, Poor Drainage system, Heavy vehicle Movement , Population pressure

DISASTER MANAGEMENT

Disaster management is primarily concerned with the steps taken by an organization or a country in response to unexpected sudden or anticipated extreme events to provide quick rescue and relief facilities and to initiate steps for disaster recovery and rehabilitation.



PHASES
 Pre-Disaster Management During- Disaster Management Post- Disaster Management

PRE DISASTER MANAGEMENT

Marking the most landslide prone areas

Scientific Construction of roads , buildings and settlement.

Learn about the emergency response and evacuation plans.

To develop drainage system.

Prohibit deforestation on slopes.

To control soil erosion.

Avoid the use of brittle pipe lines.

Road construction away from prone area.

Increase the public awareness.

DURING DISASTER MANAGEMENT

Volunteers need to move people to safety.

Rescue work should be carried out on an emergency basis.

Relief camp need to be set up for people as fast as possible.

Should not touch any kind of loose materials or electrical wiring.

Try to get to the nearest high ground in the direction away from the path of the landslide.

POST DISASTER MANAGEMENT

The victims were rescued and sent to the hospital.

Quickly remove the rubble and bury the dead.

Provide the adequate supply of drinking water, food and medicine to affected areas.

Provide advance publicity and warning for subsequent landslides.

Replant damaged ground immediately.

Emergency services should be restored as fast as possible.

Check for any damaged utility lines or ruptured water mains.

LESSON LEARNED

- * The number of landslides since 2000 has increased.
- * Most of the peoples blamed rainfall and slope cutting for increased no. Of landslides .
- * There were some of the families who got GOVT. Relief .
- * Some of the respondents said that MANPOWER is the key of rescuing people.
- * The area does have a Evacuation Route.
- * Almost everyone said that GOVT. Marked landslide prone areas and aware people about the landslides.
- * Tourism is somehow correlated to Landslides.

SUGGESTION

&

CONCLUSION

- Increasing self awareness more.
- Building a protective beam or wall to buttress the bottom of the slope.
- Reducing the angle of the slope.
- Build an emergency kit.
- Tree plantation and improve drainage system .
- Take scientific advices before any type of construction work.
- Increasing more helping hands for relief work. (Like NGO , Govt. Scheme)

LANDSLIDE AS A FATAL DISASTER



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AN INSIGHT OF PESTICIDE CONTAMINATION ON ENVIRONMENT

NEHA SULTANA
SEMESTER - VI

The long-term well-being of farms and ranches depends on good quality soil, water, air and other natural resources. In order to preserve these resources good farm management needs to include protection of the environment. Although pesticides can be a help to the environment when they are used carefully and wisely, they may also cause environmental problems when not used according to all label instructions. The main environmental concerns related to pesticides are soil, water or air pollution and damage to non-target organisms including plants, birds, wildlife, fish and crops.

Environmental Fate

What Happens to Pesticides?

Pesticide use has many benefits, including controlling harmful pests, diseases and invasive plants that can impact crops and the natural environment. But pesticide use can potentially have harmful environmental impacts as well, particularly when a pesticide moves outside of the intended application site. Many processes affect what happens to pesticides in the environment. These processes include adsorption, transfer, breakdown and degradation. Transfer includes processes that move the pesticide away from the target site. These include **volatilization, spray drift, runoff, leaching, absorption and crop removal**. Each of these processes is explained in the following sections. (Ministry of Agriculture, British Columbia, 2017)



Figure no:1

Transfer Processes

Adsorption is the binding of pesticides to soil particles. The amount a pesticide is adsorbed to the soil varies with the type of pesticide, soil, moisture, soil pH, and soil texture. Pesticides are strongly adsorbed to soils that are high in clay or organic matter. They are not as strongly adsorbed to sandy soils. Most soil-bound pesticides are less likely to give off vapours or leach through the soil. They are also less easily taken up by plants. For this reason you may require the higher rate listed on the pesticide label for soils high in clay or organic matter.

Volatilization is the process of solids or liquids converting into a gas, which can move away from the initial application site. This movement is called vapour drift. Vapour drift from some herbicides can damage nearby crops. Pesticides volatilize most readily from sandy and wet soils. Hot, dry, or windy weather and small spray drops increase volatilization.

Leaching is the movement of pesticides in water through the soil. Leaching occurs downward, upward, or sideways. The factors influencing whether pesticides will be leached into groundwater include characteristics of the soil and pesticide, and their interaction with water from a rain-event such as irrigation or rainfall. These factors are summarized in the table below. Leaching can be increased when:

- 1) a rain-event occurs shortly after spraying
- 2) the pesticide is not strongly adsorbed to the soil
- 3) the pesticide is water soluble
- 4) the soil is sandy

Runoff is the movement of pesticides in water over a sloping surface. The pesticides are either mixed in the water or bound to eroding soil. Runoff can also occur when water is added to a field faster than it can be absorbed into the soil. Pesticides may move with runoff as compounds dissolved in the water or attached to soil particles. The amount of pesticide runoff depends on:

The amount of pesticide runoff depends on:

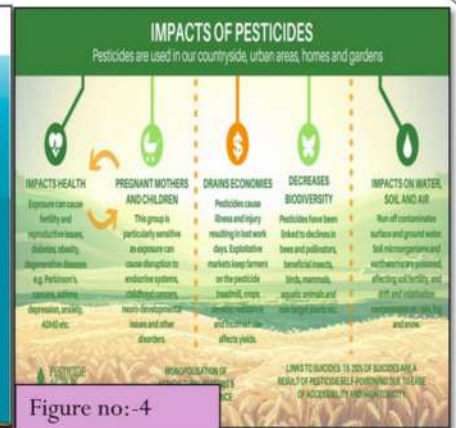
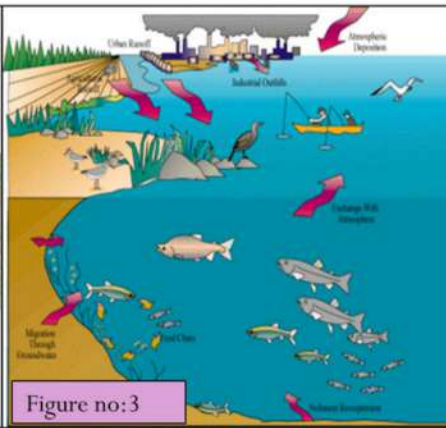
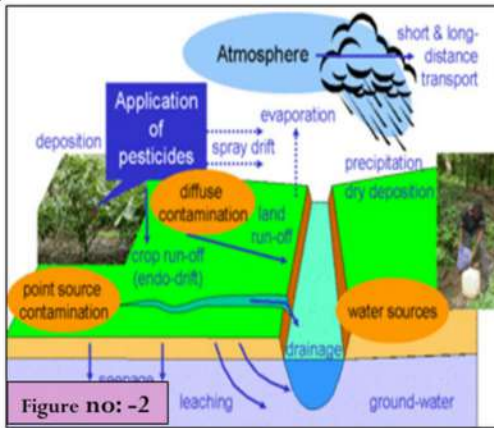
- 1) the slope, 2) the texture of the soil, 3) the soil moisture content, 4) the amount and timing of a rain-event (irrigation or rainfall) the type of pesticide used.

Runoff from areas treated with pesticides can pollute streams, ponds, lakes, and wells. Pesticide residues in surface water can harm plants and animals and contaminate groundwater. Water contamination can affect livestock and crops downstream. Pesticide runoff can be reduced by:

- 1) using minimum tillage techniques to reduce soil erosion, 2) grading surface to reduce slopes, 3) diking to contain runoff, 4) leaving border vegetation and plant cover to contain runoff.

Pesticide losses from runoff are greatest when it rains heavily right after you spray. Reduce the chances of runoff by watching the weather forecast. If heavy rain is expected, delay spraying to avoid runoff. Irrigate according to label instructions.

(Ministry of Agriculture, British Columbia, 2017)



Impacts of pesticides on the environment

Pesticides are toxic chemicals designed to be deliberately released into the environment. Although each pesticide is meant to kill a certain pest, a very large percentage of pesticides reach a destination other than their target. Pesticides easily contaminate the air, ground and water when they run off from fields, escape storage tanks, are not discarded properly, and especially when they are sprayed aerially.

Water

Pesticides can be found in rain, ground water, streams, rivers, lakes and oceans.

There are four major ways that pesticides can reach the water : it can drift outside of the area of where it was sprayed , it can leach through the soil , it can be carried as runoff , or it may be spilled accidentally.

Studies by the UK government show that pesticide concentrations exceed those allowable for drinking water in some samples of river water and groundwater.

Soil

The use of pesticides decreases the general biodiversity in the soil. Soil quality is higher without chemicals and this allows for higher water retention, necessary for plants to grow.

Plants

Nitrogen fixation, which is necessary for the growth of many large plants, is hindered by pesticides that can be found in soil. This can lead to a large decline in crop yields. Application of pesticides to crops that are in bloom can kill honeybees, which act as pollinators. This also decreases crop pollination and reproduction.

Animals

Animals may be poisoned by pesticide residues that remain on food after spraying. An application of pesticides in an area can eliminate food sources that certain types of animals need, causing the animals to relocate, change their diet, or starve. Poisoning from pesticides can even make its way up the food chain; for example, birds can be harmed when they eat insects and worms that have consumed pesticides.

Immediate Health Effects on human

Immediate health effects from pesticide exposure includes irritation of the nose, throat, and skin causing burning, stinging and itching as well as rashes and blisters. Nausea, dizziness and diarrhea are also common. People with asthma may have very severe reactions to some pesticides, particularly pyrethrin , organophosphate and carbamate pesticides

Long-term Health Effects

Chronic health effects include cancer and other tumors; brain and nervous system damage; birth defects; infertility and other reproductive problems; and damage to the liver, kidneys, lungs and other body organs. Chronic effects may not appear for weeks, months or even years after exposure, making it difficult to link health impacts to pesticides.

Pesticides have been implicated in human studies of leukemia, lymphoma and cancers of the brain, breasts, prostate, testes and ovaries. Reproductive harm from pesticides includes birth defects, still birth, spontaneous abortion, sterility and infertility.

Endocrine disruptors are chemicals that — often at extremely low doses — interfere with important bodily functions by mimicking or blocking hormones (the chemical messengers that circulate in blood and regulate many body processes including metabolism, brain development, the sleep cycle and stress response). Some pesticides act as endocrine disruptors and have been shown to cause serious harm to animals, including cancer, sterility and developmental problems. Similar impacts have been associated with human exposure to these chemicals. (University of Illinois Urbana ,1993)

Ways to Minimize Pesticide Impact

The following are several practices which reduce the potential for pesticides to cause environmental damage or water contamination. Consider applying these practices on your farm.

Integrated Pest Management Follow integrated pest management (IPM) principals. IPM doesn't rely solely on chemicals for pest control. Biological control, cultural practices, and timely chemical applications are used to obtain the necessary level of control. Pesticides are the last line of defense and are used only when pest levels are causing sufficient damage to offset the expense of the application.

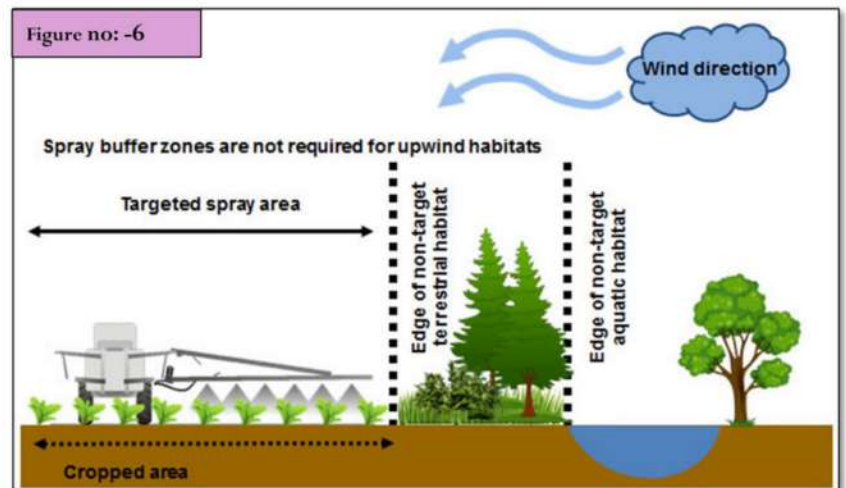
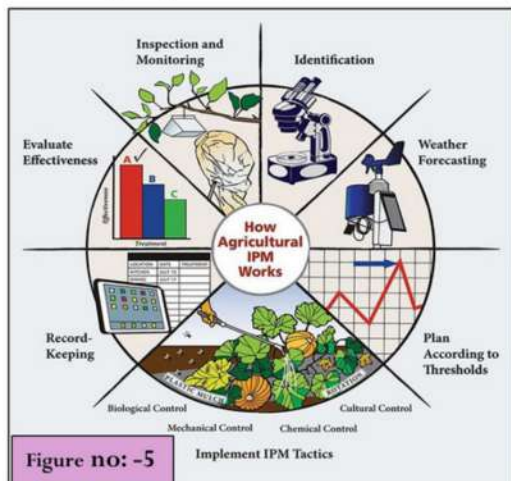
Prevent backsiphoning and spills Never allow a hose used for filling a spray tank to extend below the level of the water in the tank. Contain all spills as quickly as possible and handle according to label directions. Use anti-siphon devices in the water line. They are inexpensive and effective.

Consider weather and irrigation plans Application just before rainfall or irrigation may result in reduced efficacy if the pesticide is washed off the target crop, resulting in the need to reapply the pesticide. Heavy rainfall may also cause pesticide-contaminated runoff at the application site.

Pesticide use and storage Always read and follow the label directions on the pesticide container. Avoid mixing pesticides near wells or other sources of water. Store all pesticides safely, and according to legal requirements.

Dispose of pesticide and chemical wastes safely .Dispose of excess chemical and pesticide containers in accordance with label directions. Triple-rinse empty pesticide containers (use this water in the spray tank), punch holes in containers, and dispose of them at approved waste disposal sites.

Reduce off-target drift .Never begin an application when wind or temperature favours pesticide drift to an off target area. Use appropriate spray pressure and nozzle selection to minimize drift. (University of Illinois Urbana ,1993)



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COASTAL EROSION AND ITS ENVIRONMENTAL IMPACT ON DIGHA

RUNI GOSWAMI

SEMESTER - VI

SEMESTER - VI

Abstract:

Coastal erosion poses a significant threat to the coastal belt of Digha, resulting in the degradation of the environment and ecotourism. The region's flora and fauna are at stake, while climatic changes further exacerbate the disaster. In response, management laws have been formulated to protect the coastal track from erosion. This article aims to provide a comprehensive understanding of the environmental issues caused by coastal erosion in Digha and propose effective management strategies.

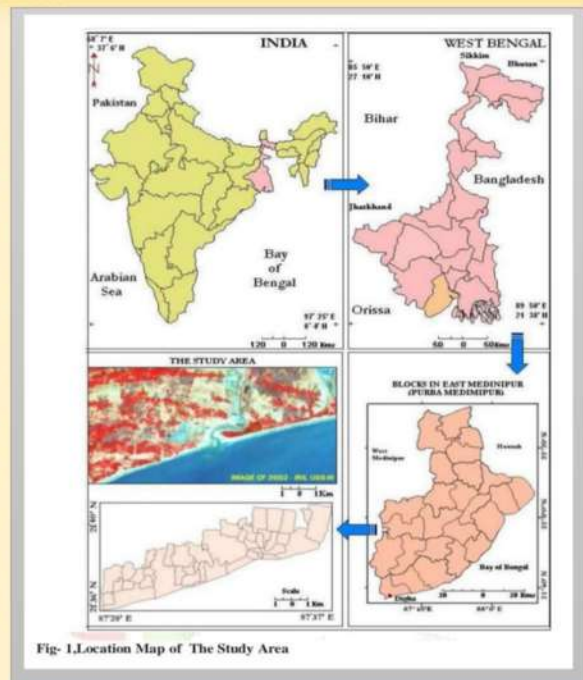


Fig-1. Location Map of The Study Area

Introduction

Coastal erosion, driven by natural processes, poses a serious threat to life and property, particularly in the coastal belt of Digha. Understanding the dynamics of coastal change is of paramount importance, given the concentration of resources in coastal zones.

Coastal Erosion and its Relationship with Cyclones

The impact of tropical cyclones on the coastline and marine life is profound. These cyclones result in beach litter and pollution, wreaking havoc on the socio-economic infrastructure of the region.

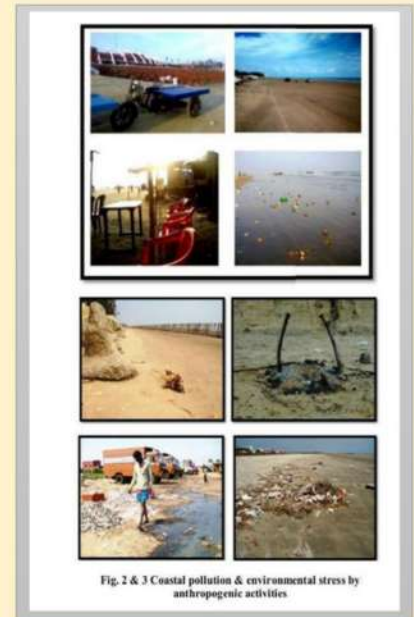
Beach Accommodation

The availability of beach shacks is limited, and the condition of the Old Digha region is deteriorating. Additionally, beach littering and extreme storm surges further compound the challenges faced in coastal areas.

Coastal Pollution

Coastal erosion leads to several forms of pollution:

- Depletion of groundwater resources due to saltwater intrusion.
- Air and noise pollution resulting from increased human activities and infrastructure development.
- Deforestation and destruction of dunes to accommodate human settlements.
- Traffic congestion caused by unplanned urbanization and tourism.
- Excessive tourism pressure, leading to overcrowding and strain on resources.
- Improper garbage disposal practices, further degrading the coastal environment.

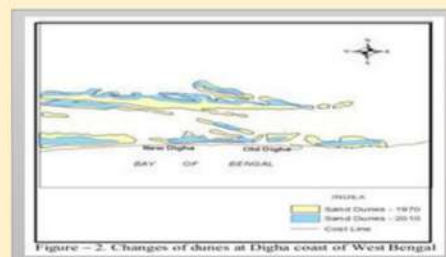
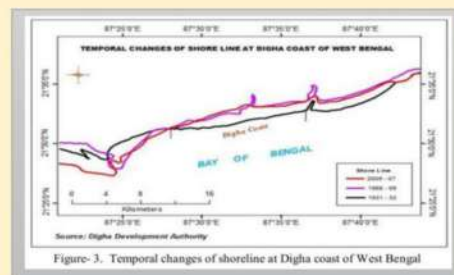


Changing Pattern of Beach Morphology

The beach morphology in Digha has experienced significant changes due to coastal erosion:

1. The active depositional processes along the beach-fringed shore have reduced the height of younger dunes. This ongoing geomorphic process necessitates continual coastline modifications.

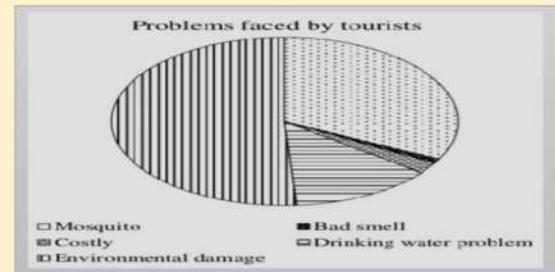
2. Over the past 15 years, wave erosion has caused a gradual shift in the coastline towards contiguous land. As a result, the proportion of land and water has changed, with nearly 10% of land being swallowed by water bodies (Carter,1988).



Tourism and Environment

The unplanned growth of tourism in Digha has had detrimental effects on the environment:

- Travelers frequently express concerns about environmental damage and pollution caused by unplanned tourism activities.
- The unregulated expansion of industries, economic impacts, seasonal unemployment, and rural-urban migration have significantly impacted the surrounding atmosphere and ecosystems (Paul, 2002).



Managements

To address the environmental issues arising from coastal erosion, the following management strategies are recommended:

- Implementing proper protections for coastal dunes to preserve their integrity.
- Restoring and enhancing forest areas in the coastal region to promote ecological balance.
- Establishing measures for sand transportation to maintain a healthy beach profile.
- Constructing artificial barriers across wind paths to minimize erosion and protect coastal areas.
- Regulating the rapid growth of aquaculture to preserve the coastal ecosystem.
- Embracing technological advancements to develop sustainable socio-economic structures.
- Conducting public awareness campaigns to educate and engage local communities and tourists in environmental conservation efforts.

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IMPROPER GARBAGE DISPOSAL

SRIJAN DUTTA

SEMESTER - IV

CAUSES OF IMPROPER GARBAGE DISPOSAL



ESCALATION OF RESIDENTIAL HOUSE: The continuous increase in population has resulted in a growing demand for residential spaces. To accommodate this demand, there has been a rapid escalation in the construction of residential houses. However, this rapid urbanization has led to a shortage of suitable disposal land, which in turn contributes to improper garbage disposal. The lack of available space for waste management poses a significant challenge, forcing residents to resort to inadequate disposal methods.

DEBRIS FROM CONSTRUCTION & DEMOLITION: For In response to the population growth and the need for more housing, older residential structures are being demolished to make way for vertical residential houses or apartment complexes. The debris generated from these construction and demolition activities often ends up being improperly discarded. Due to the scarcity of vacant land, the debris may be left on roadsides or empty barrel lands, further exacerbating the issue of improper garbage disposal.



ABSENCE OF EQUIPMENT TO HANDLE THE SOLID WASTE: The absence or inadequate availability of equipment to handle solid waste is another contributing factor to improper garbage disposal. Proper waste management requires efficient equipment for waste collection, transportation, and disposal. However, in many areas, there is a lack of proper equipment or insufficient investment in waste management infrastructure. This deficiency hampers the effective handling of solid waste, leading to improper disposal practices.

LACK OF PROPER COMMUNITY AWARENESS : A lack of proper awareness among the community regarding responsible waste management is a significant challenge. When individuals are not adequately informed about the importance of proper waste disposal and the potential consequences of improper practices, they are more likely to engage in careless or negligent behavior. Public awareness campaigns and educational initiatives are necessary to address this issue and foster a sense of responsibility towards proper garbage disposal.

EFFECTS OF IMPROPER GARBAGE DISPOSAL



ENVIRONMENTAL POLLUTION: Improper disposal of garbage, such as littering or illegal dumping, has severe environmental implications. Non-biodegradable materials, including plastics, metals, and other waste, can accumulate in natural habitats such as water bodies, forests, and parks. This accumulation not only disrupts the delicate ecosystems but also poses a threat to wildlife. The pollution caused by improper disposal practices can have long-lasting negative impacts on the environment.

SPREAD OF DISEASES: Improper garbage disposal provides favorable conditions for the breeding of disease-carrying pests, including flies, mosquitoes, rats, and cockroaches. These pests thrive in unsanitary environments, and their presence increases the risk of disease transmission to humans. Diseases such as dengue fever, malaria, cholera, and gastrointestinal infections can spread more easily when proper waste management practices are not implemented.



AIR POLLUTION: Improper waste management practices, such as open burning of waste, contribute to air pollution. Burning materials such as plastics, rubber, and other waste releases toxic fumes and particulate matter into the air. These pollutants can have detrimental effects on air quality and human health. Inhalation of these harmful substances can lead to respiratory issues, exacerbate existing conditions, and contribute to the overall deterioration of air quality in the surrounding areas.

SOIL DEGRADATION & CLIMATE CHANGE: Improper disposal of organic waste can result in soil degradation and contamination. When organic waste is not properly managed, it decomposes and releases harmful substances into the soil, negatively impacting soil fertility and agricultural productivity. Furthermore, improper disposal methods such as using waste materials as landfill cover can further degrade soil quality and hinder land use. The degradation of soil and the inefficient management of waste contribute to climate change by releasing greenhouse gases and exacerbating environmental challenges.

CONTROLLING FACTORS OF GARBAGE DISPOSAL



EDUCATION & AWARENESS: Increasing public awareness and educating communities about the importance of proper waste disposal practices are crucial steps in addressing improper garbage disposal. Educational campaigns can focus on waste segregation, recycling, composting, and the potential environmental and health impacts of improper disposal. By fostering a sense of responsibility and providing knowledge about sustainable waste management practices, communities can actively participate in mitigating improper garbage disposal.

INFRASTRUCTURE IMPROVEMENT: Efforts to improve waste management infrastructure are essential for controlling improper garbage disposal. Adequate infrastructure includes the provision of sufficient garbage bins strategically placed in residential and public areas. Investing in recycling facilities, composting facilities, and hazardous waste disposal centres is necessary to ensure that different types of waste are managed properly and responsibly.



ENFORCEMENT OF REGULATIONS: Implementing and enforcing waste management regulations are necessary to control improper garbage disposal. Local authorities should establish clear guidelines and regulations pertaining to waste disposal, including penalties for illegal dumping, littering, and other improper disposal practices. Regular monitoring and inspections by relevant authorities can help ensure compliance with waste management regulations and deter individuals from engaging in improper disposal behaviours.

REDUCE, REUSE, RECYCLE: The principles of "Reduce, Reuse, Recycle" play a pivotal role in addressing improper garbage disposal. Reducing waste generation by promoting conscious consumption and minimizing unnecessary packaging is crucial. Encouraging the reuse of items whenever possible and supporting initiatives such as thrift stores or donation centres can reduce the amount of waste ending up in landfills. Recycling programs should be implemented and widely accessible, allowing individuals to divert recyclable materials from the waste stream.



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NURTURE THE NATURE

ACT LOCALLY

