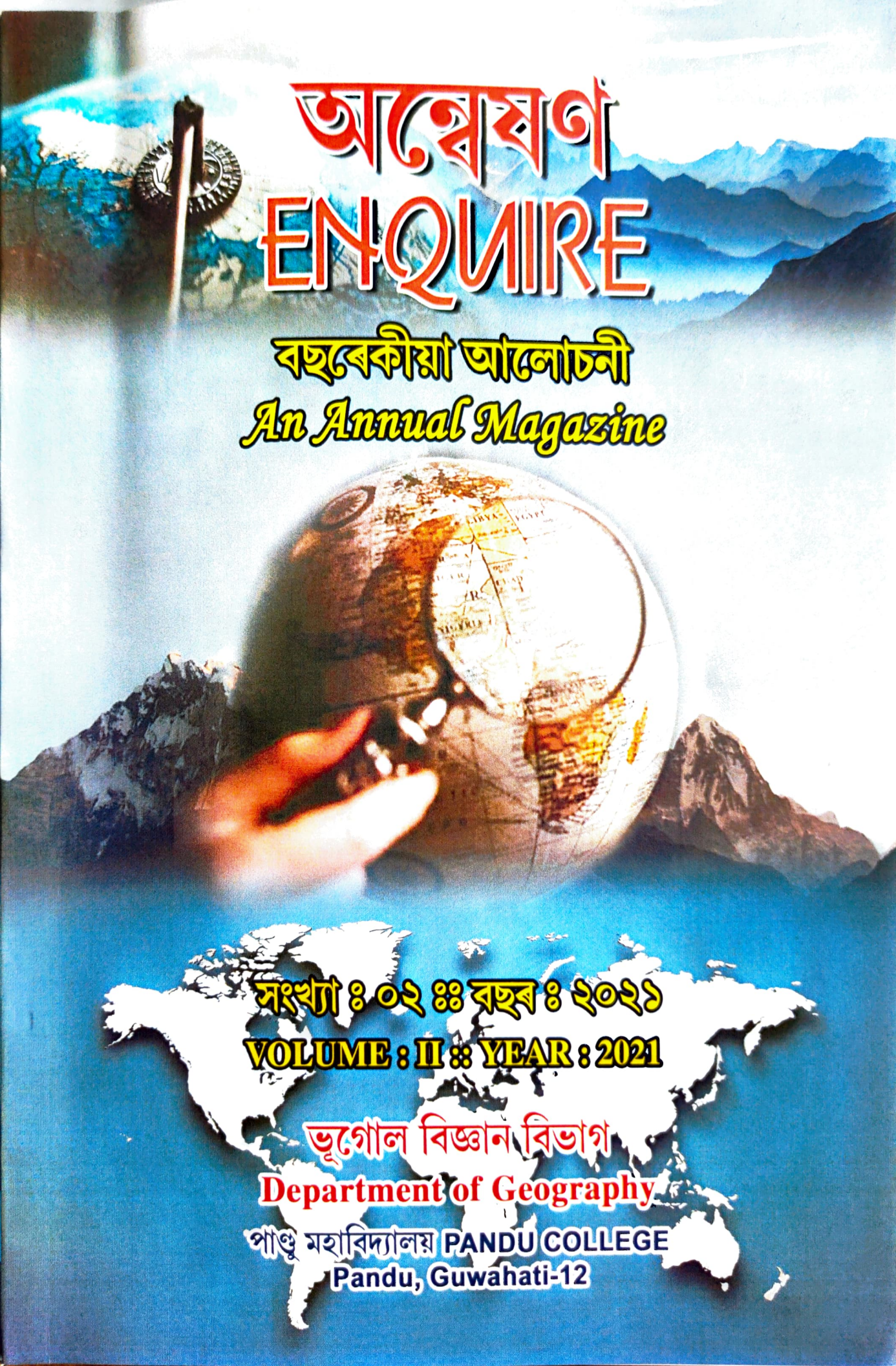

অন্বেষণ
ENQUIRE

বছৰেকীয়া আলোচনী
An Annual Magazine

সংখ্যা ঃ ০২ ঃঃ বছৰ ঃ ২০২১
VOLUME : II :: YEAR : 2021

ভূগোল বিজ্ঞান বিভাগ
Department of Geography
পাণ্ডু মহাবিদ্যালয় PANDU COLLEGE
Pandu, Guwahati-12

First Semester (UG), 2021

Third Semester (UG), 2021

Fifth Semester (UG), 2021

First Semester (PG), 2021

Third Semester (PG), 2021

অন্বেষণ

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Department of Geography

পাণ্ডু মহাবিদ্যালয় Pandu College

Pandu, Guwahati-12

Editorial Board

TRIBUTE

We have no control over natural calamities but we do have control over our minds. We extend our heartfelt condolences and sympathies to the families of the victims of the flood occurred at Dima Hasao District. May God impart the strength to get over the loss. This natural disaster brought along. Let us not give up to these challenging times.

অধ্যক্ষৰ কার্যালয়

Office of the Principal

পাণ্ডু মহাবিদ্যালয়, পাণ্ডু
গুৱাহাটী - ৭৮১০১২
Pandu College, Pandu
Guwahati-781012

URL : http/www.panducollege.org
E-mail : principal@panducollege.org
info@panducollege.org
Phone : 0361-2570450

From : Dr. Jogesh Kakati, M.A., Ph.D., Principal
শ্রী যোগেশ কাকতি, এম. এ., পি. এইচ. ডি., অধ্যক্ষ

MESSAGE

I am very much glad to know that the Department of Geography is publishing its Magazine named as ***Enquire, 2020-2021.***

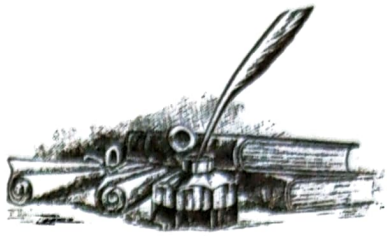
Magazines always encourage the students to think and write. I highly appreciate the entire department for motivating the students and fruitfully utilising their skills.

My best wishes to the entire faculty and to the students.

(Dr. Jogesh Kakati)
Principal
Pandu College, Pandu

Principal
PANDU COLLEGE
Guwahati-12

সম্পাদকীয় চকীৰ পৰা



সম্পাদকৰ একলম

সম্পাদকীয় কলমৰ আৰম্ভণিতে পাণ্ডু মহাবিদ্যালয় প্রতিষ্ঠিত হোৱাত সহায় কৰা প্রতিগৰাকী মহান শিক্ষাগুৰুক প্রণাম জনালো। যাৰ প্রচেষ্টাত প্রাণ পাই উঠিছিল আমাৰ গৌৰৱ পাণ্ডু মহাবিদ্যালয় খনিয়ে। প্রথমতে আমি পাণ্ডু মহাবিদ্যালয়ৰ সন্মানীয় অধ্যক্ষ মহোদয় ড০ যোগেশ কাকতি মহাশয়, সন্মানীয় অধ্যাপক অধ্যাপিকা সকলৰ লগতে কর্মকর্তা সকলক শ্রদ্ধাৰে প্রণিপাত জনাইছো। আলোচনী এখন সম্পাদনা কৰিব পৰাকৈ আমি কিমান যোগ্য নাজানো, এই আলোচনী খনৰ সম্পাদনাৰ দায়িত্ব লৈ আমি অতি নিখুঁতভাবে আগুৱাই নিয়াৰ যত্ন কৰিছো। বিভাগীয় আলোচনী এখনৰ দ্বাৰা সেই নির্দিষ্ট বিভাগটোৰ কর্মৰ পৰিচয় পোৱা যায়। ইয়াক সজায়তোলাটো উজু নহয়। এইক্ষেত্রত আমাক সহায় আগবঢ়োৱা ভূগোল বিভাগৰ অধ্যাপক অধ্যাপিকা সকলৰ লগতে কর্মকর্তা আৰু তথা ছাত্র-ছাত্রীসকলক আমাৰ তৰফৰ পৰা আন্তৰিক ধন্যবাদ জ্ঞাপন কৰিলোঁ। ভূগোল বিভাগৰ এই আলোচনীখন আৰম্ভ কৰাৰ উদ্দেশ্য হৈছে ভূগোল বিষয়ৰ অধ্যয়নত ছাত্র-ছাত্রীসকলৰ মাজত থকা অন্তর্নিহিত ভৌগোলিক সত্বাক তেওঁলোকৰ দৃষ্টিভঙ্গীৰে বিশ্লেষণৰ সুযোগ দিয়া। পাণ্ডু মহাবিদ্যালয়খন প্রতিষ্ঠা হৈছিল ১৯৬২ চনৰ ৫ ছেপ্টেম্বৰত। এই মহাবিদ্যালয়খনৰ এক অন্তর্নিহিত বিভাগ হ'ল ভূগোল বিজ্ঞান বিভাগ। ভূগোল বিভাগৰ বছৰেকীয়া আলোচনী অন্বেষণৰ প্রতিটো সংখ্যা অতিমৰমৰ আৰু বহুত আবেগ-অনুভূতিজৰিত হৈ আছে। সেয়ে আলোচনীখন সফল কৰাৰ আঁৰত সন্মানীয় বিভাগৰ মূৰব্বী ড° নিৰঞ্জন ভট্টাচার্য মহাশয়ৰ লগতে সম্পাদনা সমিতিৰ প্রতিগৰাকী সন্মানীয় সদস্যৰ সহযোগিতাৰ বাবে তেওঁলোকৰ ওচৰত আমি চিৰঋণী। ২০১৯-২০ বর্ষৰ দৰে ২০২১ বর্ষৰ আলোচনীখন প্রকাশৰ বাবে আমি যৎপৰোনাস্তি চেষ্টা কৰিছিলোঁ যদিও Covid-19 মহামাৰীৰ বাবে কিছু অসুবিধাৰ সন্মুখীন হৈছিলো, আলোচনীখন প্রকাশৰ ক্ষেত্রত কিছু পলম নোহোৱা নহয়। ইয়াৰ বাবে সমুহ পাঠকৰ ওচৰত আমি ক্ষমাপ্রার্থী।

সদৌ শেষত মুদ্রণৰ দায়িত্ব বহন কৰা আল্পনা গ্রাফিক্সৰ স্বত্বাধিকাৰি তথা সমুহ কর্মচাৰীবৃন্দলৈ আন্তৰিক কৃতজ্ঞতা জনাই আমাৰ সম্পাদকীয় অনুভৱৰ সামৰণি মাৰিছো।

জয়তু পাণ্ডু মহাবিদ্যালয়
ভূগোল বিজ্ঞান বিভাগ

বনশ্রী দাস, নিশান্ত শইকীয়া
সম্পাদকদ্বয়

CONTENT

PART-I : ACADEMIC ARTICLES

PART-II: DEPARTMENTAL PROFILE AND ACADEMIC

PART-I
ACADEMIC ARTICLES

Chandubi Lake : A Wetland of Geo-Ecological Significance

PG 3rd Semester (2020-2022)

Abstract

The present study gives emphasis on the geological properties as well as ecological significance of the Chandubi Lake. The lake is considered as a major geologically active zone of Assam. The Wetland is a home of various plants and animals species. The study give importance on the present ecological status of the Chandubi wetland as well as highlights the biological diversities of various endemic plants and animals species, bird species, fish species and their adaptation to the Wetland ecology.

Key Words: Wetland, Geoecological, Tectonic Lake, Biological Diversity, Endemic.

Introduction

Wetlands are the areas having water as principle factors of controlling the environment and associated life of flora and fauna. They occur at place where water table is next at or near the surface of the land. According to Ramsar convention "wetlands are defined as areas having marsh, fen, wetland one water whether natural ore artificial, permanent or temporary, with water that in static or flowing, fresh, brackish or salt including areas of marine water the depth of which at low tide does not exceed six metres.." The study area Chandubi Lake situated within the Loharghat range of Kamrup rural district. A large wetland created by the devastating earthquake of 1897. The lake has great geo-ecological significance in terms of biological resources and geological properties such as geomorphology and geotectonics. The wetland is ecologically stable and has great number of various plants and animals species. The wetland is also a home of migratory bird during winter period. The lake provides a healthy ecosystem to Gangetic Dolphins, species platanista Gangetica, coming from.

Objective

The main objectives of the study are to understand the geological and ecological significance of the wetland and relationship between various geoecological components of the Wetland ecosystem.

Study Area

The Chandubi wetland is located at the foothills of Garo hills surrounded by Meghalaya and Assam. The lake receives inflow from river Kulsi, southern tributary of river Brahmaputra. The wetland has a tectonic origin which was formed due to the devastating earthquake having magnitude of 8.1 Richter in 1897. During this devastating event the forest went down and became

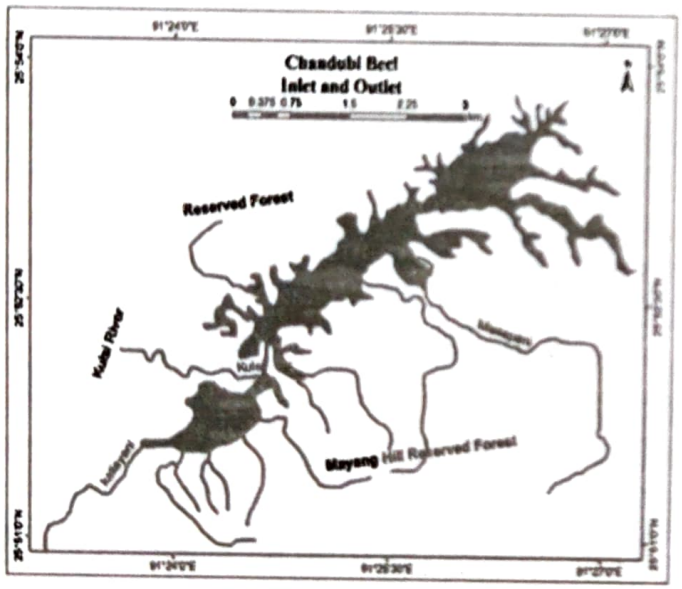


Fig.1 Location of Study Area

the lake. The wetland is located in the Raja para village of Kamrup district of Assam at a distance of 64 kilometres from the city Guwahati accessible through National Highway 37. The area is geographically located at latitude of 25°88'15" N and longitude 91°42'35"E.The climate of the area is identified as Koppen Cwa: Monsoon influenced humid subtropical climate.

Database and Methodology

The study is carried out using secondary data from various research publications on ecology and geological studies of Chandubi Lake Forest department of Assam etc. The Methodology used in this study is mainly statistical analysis like tabulation and cartographic techniques like mapping.

Results and Discussion

From various standard scientific literatures., it is observed that the wetland is a tectonically formed freshwater lake. The wetland in its western part is connected by a 2.5 kilometre long inlet /outlet channel named, Loke ya jan with the river Kulsi, a tributary of the river Brahmaputra. This channel acts as a passage of water from wetland to the Kulsi tributary and vice-versa. The auto stocking character of this wetland is maintain through this channel since a large number of fish species do migrate from Kulsi river to the wetland for feeding and breeding during the time of flood. Duarah and Phukan (2011), observed that between years 1911 -13 and 2002, the Chandubi lake shrieked its water holding capacity from 10.23 to 1.19 kilometre sq loosing 88.36% of its water spread. So the present basin area of the wetland estimated about 271 hectare after the shrinkage from 712 hectare from its origin. It embraces a stretch of about 56 sq. km. catchment area and watershed having rough hilly terrain, evergreen deciduous plants silted shallow plain. Soils of the wetland is identified as old mountain valley alluvial soil. These are mainly heavy texture soil. The surface soils

are compact, very sticky and very plastic. The texture of the soil also becomes heavier along with the depth. From the previous research study on water quality is recorded that the water of this wetland is slightly acidic and the PH value is less than 5. Phosphate concentration is negligible in this lake. In some the phosphate concentrate areas slightly lesser amount of, No3 is present. This may an indication of denitrification of nitrate phase in the biochemical environment which meant in some areas a small amount of fluoride is also found (4 can be describes in terms of leaching of mineral phase. Study clearly revealed the absence of fatal arsenic species in all the water bodies. Some areas having water of alkaline nature due to the presence of Calcium and Magnesium rich rocks. While considering the presence of heavy metal the wetland has considerable amount of iron, calcium, potassium (K+) ions. Potassium ions showed a homogeneous distribution throughout the water body, but in some areas. slightly gradual increase of sodium (Na) ions also seen. The wetland has various types of aquatic and terrestrial plants species. Previous research studies concluded that the wetland has numerous aquatic and terrestrial plants and animal species. The important aquatic plant species include water hyacinth, waterlily, mokhona, pistia, Cara, hydrila, algae, terrestrial plants like sal, teak, gomari, Doha etc. Some important terrestrial floral species casia sophera, Fern, Sal forest are predominately found in the so surrounding areas of the lake. Different orchid species which found in the wetlandare Calantha odora, Eria barbata, Eria ferrugina Eulophi manni, Gastrodia exilis. Habelaria concinna, Liparis Torta, Tainia Khasiana (Forest department, Govt. of Assam). Various animals species founded in Chandubi wetland are Slow loris *(Nycticebus coucang)*, Hoolock gibbon *(Hylobates hoolock)*, Elephant *(Elephus Maximus)*, Bear cat (Arctictis bintarong), clouded leopard *(Neofelis nubulosa)*, Fishing cat (*Felis verrina* bennet 1 Golden gat *(selis tanninckі")*, Swamp Deer *(Crims duvauchi)* (Forest department, Govt of Assam). Other endemic of Chandubi wetland included watersnake, python, water frog, salamander and various mammals included elephant, Gangetic dolphins, Fox etc. The clear and fish abundant water of Chandubi lake makes it an ideal stop over migratory birds during winters. The important bind species included Forktail river chats, Ruddy shelduck, pied hornbills, Bulbul, Duck, Jungle fowls, Brahminy ducks, pelican, egret, Scarlet, minivet, Magpie Robins, ospreys, Herron etc.The wetland has numerous fish species. Important fish species are *Notopterusnotopterus, Gudusiachapra, Denio Renio, Rashbora daniconius, cyprinus carpio, Linnaeus, LabeoCalbasu Labeo gonius,Labeo rohita (Rohu), puntias chola, P.sophie, I terio, Gibelion Catla Bata Mvittatus,Mtengra, Opabo, Botia Dario, Pethia gelius,Pethia Ari etc.* [pathak and Goswami), phutki puthi and Nandhani Gangetic crocodiles has used to be seen until 1960.

Table 1. Orchid Species founded in Chandubi Lake

Sl.No	Name of the Species	Ecological status
1.	*Calantha odora*	Endemic
2.	*Eria barbata*	Endemic
3.	*Eria ferrugina*	Endemic
4.	*Eulophi manni*	Endemic
5.	*Gastrodia exilis*	Endemic
6.	*Habelaria concinna*	Endemic
7.	*Liparis delicupala*	Endemic
8.	*Liparis torta*	Endemic
9.	*Tainia Khasiana*	Endemic

Source: Forest Department, Govt of Assam

Table 2. Name of some Animal Species found in Chandubi lake

Sl.No	Common Name	Scientific Name
1.	Slow loris	*Nycticebus coucang*
2.	Hoolock gibbon	*Hylobates hoolock*
3.	Elephant	*Eplephus Maximus*
4.	Bear cat	*Arctictis bintarong*
5.	Clouded leopard	*Neofelis nubulosa*
6.	Fishing cat	*Felis Bettina bennet*
7.	Golden gat	*Selis tanuincki*
8.	Swamp deer	*Ervus duvauchi*

Source: Forest department, Govt of Assam, 2011

Conclusion

The study initiated by us helps us to identify the area and the tectonics of the Chandubi Lake. We come to know about the lake which has a great geo-ecological significance in terms of biological resources and Geo-ecological properties. Earlier researches reveals that the wetland is a home of various tropical plants and animal species. The lake is a home of several orchid species. The lake is also a habitat for critically endangered fish species Nandhani and ornamental fish species Phutki puthi. Tectonically originated Chandubi Lake also provides a healthy ecosystem to Gangetic dolphins.

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N.B.- *PG 3rd Sem Students: Snehasish Choudhury, Shibani Saikia, Nijara Pathak, Nikhilmani Deka, Priyanka Barman, Nandini Rajbongshi, Jayakrishna Bhuyan, Dimpi Talukdar, Deiji Deka, Nabanita Thakuria, Bijaya Saha, Jayshree Das, Himshikha Deka, Jubin Jyoti Deka*

Drug Smuggling to Drug Trap : An Analysis with Special Reference to Guwahati City

PG 1st Semester (2021-2023)

Abstract

Drug smuggling has become a serious concern in the present era. The ongoing scenario in and around Guwahati has shook the entire state. The majority of the population found in this dirty work is the youngsters who got trapped. Since the last decade the cases in Guwahati have increased dramatically and the worst part is the majority of the people involved in this heinous act are the youths or teens and how the innocent minds got trapped in this filthy work.

Keywords: Drugs, Youngsters, Guwahati, Trapped

Introduction

Guwahati is a sprawling city beside the Brahmaputra River in the northeast Indian state of Assam. Extending from 26°14'45"N latitude 91°73'62" E longitude. It's known for holy sites like the hilltop Kamakhya Temple, featuring shrines to the Hindu deities Shiva and Vishnu. Dispur, the capital of Assam, is in the circuit city region located within Guwahati and is the seat of the Government of Assam. A major riverine port city along with hills and one of the fastest growing cities in India, Guwahati is situated on the south bank of the Brahmaputra. It is called the 'Gateway to North East India'. But, the dark side of the beautiful city is the increasing rate of drug smuggling and consumption which has ruined a number of lives.

Statement of the Problem

Drug addiction is a very complex disease in reality. Once someone starts taking it, it becomes the addiction of the person and no sooner it becomes his necessity. Since the last decade the trend in Guwahati shows that drug smuggling and consumption has risen at an alarming rate and the Assam police has registered the highest number of cases under Narcotics Drugs and Psychotropic substances (NDPS) act in 2016.

Data Source and Methodology

All the data have been collected from secondary data i.e. online sources, papers, journals, books.

Objectives

1. To find out the trend of drug smuggling in Guwahati in the last few years.
2. To understand the 'Drug trap'
3. To find the steps against this filthy work.

Findings

* Drug smuggling trend in Guwahati from the last three decades drug related drugs can be observed in Guwahati and nearby areas. And it is increasing by time. According to the police, Guwahati is the transit point in the region drugs that enter India from Myanmar through international border.
* Drug addiction has increased immensely in Assam in recent years, earlier drugs used transport via state but now it is getting sold within Assam by a huge network of traffickers, hence easy availability has led to more people getting addicted.

Why do people do drugs? And how do they fall into the 'Drug trap

There are many causes behind the consumption of drugs, some of them are-To fit in(they want to be accepted by the friends who are doing drugs), to feel good, release stress and tensions, marital problems, family issues etc, apart these main reasons why people do drugs are relationship problems, do good in sports and many other fields.

The 'Drug Trap'

The drug trap is a trap similar to the pitcher plant, once you fall into it; it becomes hardly possible to get out of it. The addiction increases with each passing day, once the drug gets into the nerves of the victim it drives him insane and gradually it becomes his necessity and that is how he gets indulged into it.

Recent Cases in Guwahati

1. On Aug 30-2021, in Guwahati, Assam Police busted an Inter- state drug Racket and seized more than 1.75 Kg of heroin worth Rs 7 crore. (@Guwahati Pol-guwahati Police Twitter Handle)
2. On Nov, 19-2021, Friday, police seized heroin worth Rs 4 crore near Byrnihat @GuwahatiPol- guwahati Police Twitter Handle).

On Wednesday, a team of Assam Police seized 50000 Yaba Tablets worth Rs 1.5 Crore from ISBT in Garchuk area of Guwahati.

Actions Taken

Honorable Chief Minister Dr. Himanta Biswa Sarma has given power to the Police for full Operational freedom to take the toughest action within the ambit of law to deal with criminals.He even bulldozed drugs a few months back, more than 100 crore drugs have been seized over the last few months.The operation is still going on; The Assam Government is also planning to maximize rehabilitation centers.

Conclusion

The present scenario of Drug smuggling and trafficking is changing little by little. The operation of making Assam a drug free state will definitely take time but the Strict actions taken by the Government and other higher Dignitaries has changed the scenario, that is, cases are still on rise but looking at the positive side, many drug peddlers have been arrested. Drug smuggling to addiction is a long chain and a vicious cycle, one cannot get victory in a day or month, this is going to take time and many more years but we will conquer the battle soon.

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N.B.- *PG 1st Sem Students: Debolina Chakraborty, Dhruv Boro, Mugdha Das, Nishanta Saikia, Nirmoni Das, Dimpi Dutta, Momi Barman, Jugasmita Choudhury*

Impact of Manufacturing Industries in Yamuna River

PG 1st Semester (2021-2023)

Abstract

The Yamuna River, which is the lifeline of Delhi, is one of the most polluted river in the country. About 85 percent of the pollution is caused by domestic and industrial effluents or sources. The present study aims to find out the impact of the industries on the river ecosystem. The data used in this paper are mainly from secondary sources. It is found that a wide range of contaminants are continuously introduced into the river and their toxicity is a problem of increasing significance for ecological, evolutionary and environmental reasons. The impact of bioaccumulation of the heavy metals may cause damage to the human health. The findings concludes that the prevailing condition of the river is of serious concern and there is an urgent need to take strict measures to ensure, cleansing of the river and prevent further contamination.

Keywords: Yamuna, Pollution, Ecological, Measures, Cleansing

Introduction

The river Yamuna is the second largest tributary river of the Ganga and the largest tributary in India. The river originates from the Yamunotri Glacier near Bandarpoonch peaks in the Mussourie range of the lower Himalayas at an elevation of 6,387m above the mean sea level in district Uttarakhand. The main sources of pollution are the domestic and industrial heavy metals contamination, untreated sewage, idol immersion leading to increase toxicity, plastic pollution and so on. Recently, a vast stretch of Yamuna River has been seen to be covered with white toxic foam caused in parts of pollutants discharged from industries ringing New Delhi.

Statement of the Problem

The Yamuna River was described as clear blue water but with the passage of time and increasing population, it has become severely populated and toxicbecause people have started treating the river as a dumping ground. From bathing, washing clothes to idol immersion. The presence of phosphates and surfactants in untreated sewage from Delhi, Haryana and Uttar Pradesh is a major reason behind frothing in the river. The sources of pollution that cause foam formation are, the pollution from sugar and paper industries in Uttar Pradesh that travel through the Hindon Canal also causes pollution in the river. Hundreds of Hindu devotees stood knee deep in its frothy noxious water in the festival of Chhath Puja.

Objective

1. To study the present condition of river Yamuna.
2. To analyze the affects exerted by pollution to the river.
3. To empty some measures for mitigating the harsh.

Methodology

Because of the pandemic collecting of first hand data or primary data was not in our favor therefore the research has been carried out after completing a detailed study and research of secondary data (newspapers, magazines, articles etc.)

Findings and Analysis

The Yamuna is particularly polluted downstream of New Delhi, the capital of India, which dumps about 58 % of its waste into the river. The most pollution comes from Wazirabad, from where Yamuna enters Delhi.

Industrial Heavy Metal Contamination

The catchment area of River Yamuna in Delhi is highly urbanized and is network with several drains. Najafgarh and Shahdara of drains are the major drains that discharge a heavy load of pollutants into the river. Rapid urbanization and pollution growth results in industrialization pose a major threat of heavy metal pollution for nearby water bodies. The water quality monitoring of River Yamuna has indicated a significant presence of several heavy metals in its water.

Untreated Sewage

Untreated sewage may contain soap-detergent particles. More than 800 million liters of largely untreated sewage is pumped in the Yamuna each day.

Other Sources

The other sources are industrial effluents, organic matters from decomposing vegetation and presence of filamentous bacteria.

• Plastic Pollution: In Agra, the Yamuna has been choked by plastic pollution. After the 2017 has on single use plastics, there has still been rampant use of plastics which is evident by the production of plastic. According to records, Delhi produces 2, 51,674 tones of plastic each year 50% of which is single use that's roughly 63,000 elephants worth of plastic.

• Domestic Sources: According to a report submitted by the Delhi Pollution Control Committee (DPCB) and the Central Pollution Control Board (CPCB) to the Yamuna Pollution Control Committee, atleast 90 % of domestic wastewater in the city flows into the Yamuna.

Conclusion

Today, by seeing the present scenario, the water of Yamuna River is highly affected by pollutant. Pollution of this river is on the rise and is becoming danger for the aquatic living beings and human beings. By seeing these effects the government has taken some steps to mitigate the problems faced by the people's staying near the river bank. The actions taken by government will make a huge difference in the country.

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N.B. : Banashri Das, Tarali Devi, Mandira Pradhan, Mrinal Sarmah, Smriti Rekha Deka, Kuheli Das, Rica Bhowmick

Impact of Illegal Bangladeshi Immigrants in Assam : A Case Study

UG 5th Semester (2019-2022)

Abstract

Assam is a land of fertile soil and the state is known for her natural resources .Due to the reasons, a large number of people from within and outside the country were attracted and immigrated to the state. In this paper an attempt has been mode to understand the various impact of illegal Bangladeshi immigrants in Assam. The data have been collected using secondary sources such as Census of India, Foreign tribunals, papers, articles etc. It has been established that illegal migration in the plains of Assam has significant implications for its demography ;economy, socio-political framework and environment generally people move either legally or illegally due to socio-economic and environmental, reasons like poverty, unemployment and climate change or in search of better opportunities like work and education, apart from for the reasons of reunification with family members, or the fear of persecution by other euthenics and political groups. Seeing the presence scenario of illegal Immigration activities pouring into Assam from Bangladesh has been posing a serious security threat to the people of Assam.

Keywords: Illegal, Migration, Assam, Implications, Political Groups

Introduction

The term immigration is not a new concept for Assam .prior to the British rule, Assam was regined by the Ahom rulers for long six hundred years. But owing to various reasons during the British rule Assam turned into an open place for the outsider's .britishers encouraged people involved in different occupation to immigrants into Assam removing all the pre-laid rules and restrictions during ahom dynasty. The British government encouraged the people to live in Assam .the large scale of tea garden people's came into Assam during in the British rule from 1971(Bangladesh war),the flow illegal migration into Assam has been increased .about 10 million people entered into Assam during the Bangladesh war. Illegal migration has been posed a serious identity threat to the indigenous people of Assam .the Assam

agitation or Assam movement was started from 1979 and ended in 1985 against the illegal migration. The assamese indigenous people feared that illegal migration can abolish the true identity and culture of indigenous people of Assam.During the period of assam movement as repoted 855 (later on 860 as submitted by AASU) no of sacrified their lives in the hope of an **"infiltration free Assam"** in the 1979-85 asssam agitation. The leaders of assam movement were demanding the identifaction and deportation of illegal immigrants from Assam. Finally the Assam accord was signed in 1985 it was a tripartite accord was signed between the government of India, state Government of Assam and leaders of Assam movement. The clause 6th of Assam accord envisages constitution, legislative and administrative measured to safeguard, protect, preserve and promote the cultural, social linguistic and heritage of the assamese people. In this write up an efferot is taken to discuss about the noteworthy Bangladesh immigrants to Assam as well as the impact of the immigration.

Objectives

The objective of the present paper is to highlight the following issues:

1. To examine the factors of illegal migration from Bangladesh to Assam.
2. To examine how immigration has impacted on political, social and environmental conditions of Assam.
3. To propose some suggestions to control. The flow of illegal migrations or Bangladeshi immigrants.

Data Source and Methodology

The project is primarily based on books and scholarly articles in journals. The information presented here is second information collected from the sources mentioned above, along with the use of internet on occasions.

Study Area

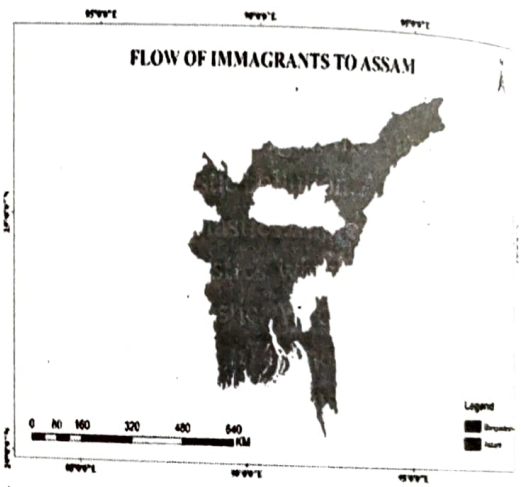

Fig. 1 Flow of Immigrant to Assam

Assam is a state in the north eastern region of India sharing international borders within Bangladesh in the Southwest and Bhutan in the North. Within the federation of India, Assam shares boundaries with six states: Arunachal Pradesh in the north and north-east, Nagaland and Manipur in the east and South-east, Meghalaya and Mizoram in the South, Tripura in its south-west and West Bengal in the west. Assam, together with these north eastern, including it's share of 262 km of which 92km is riverine (Goswami, 2006). Topographically, the north-eastern provinces are mountainous and hilly; Assam is partially hilly with two major river valleys.

Geographically, Assam comprises three major physical division : the Brahmaputra valley, the Barak valley and the hills of Karbi Anglong and North Cachar. Assam enjoys a tropical monsoon climate consisting of cool dry winter and hot wet summer. The major industries are tea, oil, natural gas, coal, granite, limestone and cement timber, fertilizer and paper mills. Assam has a diverse population mix: plains and hill tribes of different origin. The Mongoloid tribes are of Chinese, Burmese and Thai Origin. The tribe with Thai origin known as Ahom, was once ruling Assam, and according to many historians, the very name Assam might have come into being to represent the Ahom reign (Gait, 1906)

Bangladesh shares land border with Assam and Meghalaya in the North, West Bengal in the West, Tripura, Mizoram and Myanmar in the East and the Bay of Bengal in the South. As a result it almost 95 percent of its land border with India. Bangladesh, with a total area of 143,998 sq. km, has a high population density 1,015 persons per sq. km and is the seventh most populous country in the world. According to the 2011, Bangladesh Census, the majority of its population (89.5 percent) is Muslims, with 9.6 percent Hindus and others constituting 0.9 percent Bengali is the national language Bangladesh a host the confluence of 3 major rivers in the world: The Ganges, the Brahmaputra, and the Meghna. Bangladesh enjoys a tropical monsoon climate with mild winter, hot humid summer and warm rainy monsoon season. Among the major industries are cotton, textile, jute, garments, tea possessing, paper printing, cement, chemical fertilizer, Light engineering and sugar. Most of the Country is accessible by railways, airways, roadways and also waterways.

Table 1 Features at a Glance of Assam and Bangladesh

Particulars	Unit	Assam	Bangladesh
Location		South Asia	South Asia
Total area	Sq km	78,438	143998
Population	million	31.2	142.319
Decadal percent increase in population	percent	17.2	22.6
Population Density	Per sq km	398	1015
Sex ratio	Female per 1000 males	958	997

Source:Census of India, 2011

Result and Discussion

Factors

Increasing pressure on land and mounting unemployment in Bangladesh due to uncontrolled steep rise in population and high density of population (964 per sq. km) according to 2011 estimate. The large scale migration from Bangladesh to India has been possible mainly due to the pre porous India - Bangladesh border of 4,096 kilometres, the fencing of which has not been completed so far. Better economic opportunities across the border, competitive politics of vote-bank and the patronage extended to them by Political parties / vested political groups in Assam state.

Large segments of population in Bangladesh uprooted by severe floods and cyclones. Some other reasons may be poverty, family reunifications, Environmental degradation and food crisis, wars and asylum.

Consequences

1. Socio-Economic Impact

The economy of the Assam that is bordering Bangladesh is predominantly rooted in products like tea, petroleum and forest produce. Agriculture is the primary means of livelihood for most of the population. Considerable migration through illegal means from Bangladesh translates. This into a reduced share of already limited produce. Also, over a period of time, the illegal immigrants attempt to acquire or occupy land. From locals this occasionally causes alienation of tribes from their ancestral land leading to conflicts. Although these in some dew to prevent alienation of tribal land, it remains largely in effective in Assam. Thus, the major impact of the influx of Bangladeshi nationals is largely on the demography. Allegedly, huge areas of forest land were said to be encroached upon by the migrants (Saikia, 2017). As a result, it is reported that Assam faced declining pre percent of forest land from 39% in 1951-52 to about 30% in 2015-16 (Das & Talukdar, 2016).The immigrants who entered through the illegal means into Assam got access to government Subsidy programmers' including ration items apart from a availing education and health care from government schools and clinics. As a result, it impacts the state exchequer, an extra fiscal cost. Also, the influx of illegal immigrants has displaced native workers as the immigrants are prepared to take up jobs for lower wages than the natives. This is some places has led to competition and conflict. (Put bar graph)

2. Environmental Impacts

With the increasing & Bangladeshi immigrant population in the border districts of Assam there is a mounting pressure on the requirements of fuel wood, timber and land in the forest areas to meet the demand, even marginal forest lands are cleared to put on it to the plough. Forest resources from which various minor derived products, including fuel wood are needed in incremental quantities. This has led to substantial environments impact on the region

3. Political Impacts

One of the main political fallout of large Scale illegal immigration from Bangladesh into Assam had led to the rise of All Assam Gana Sangram Parishad (AAGSP) and, All Assam Student's Union (AASU) and also protests in Assam in the 1970's and 1980's. The illegal immigrants who settled in the bordering districts of Assam have successfully enrolled their name in the voter list and acquired voter identity cards. As a result, firstly they become illegal voters; Secondly, by this name means they acquire citizens (NRC) (Financial Expend. 2018) is intended for the detection of illegal Bangladeshi immigrants, the success of it as yet to be realized. Pakistan's ISI has been active in Bangladesh supporting militant movement in Assam (LT Gen Sk Sinha ,1998). It is alleged that among the illegal immigrants there are also militants, who enter in Assam to carry out the terrorist activities.

Some Recommendations to Meet the Problem

The central Government should appoint a National Immigration Commission to frame a National Migration policy and a National Refuges Policy. The Commission should examine ways of strengthening the Foreigners Act 1946, as well as feasibility of Identity Cards for both citizens and non- citizens and work permits for migrants. Border fencing in Assam must be completed forth with on a war footing. The existing Border Security force posts and the BSF water wing should be strengthened. Our nationals in the border districts and for that matter in the whole state should be provided multipurpose photo identity card. Ongoing NRC updating should be completed, without delay and proper arrangement for the deportation of illegal migrants should be done. The Illegal Migrants Determination by Tribunal (IMDT) Act of 1983 should be repealed.

Conclusion

Bangladeshi immigration into Assam has been posing a serious threat to the Indigenous people of Assam. Immigration is a continuous process. The influxes of large scale immigration have impacted not only Assam, but also whole country. The migrated people changed the Democratic conditions of Assam. Illegal immigration, has badly impacted on socio - economic, political and environmental situation of Assam. There has been emergence of new problem's like declining of forest land poverty, hunger, ethnic clashes etc. Bangladeshi Immigration is a major reason behind the population growth of Assam. The influx of illegal migration from Bangladesh is changing border district of Assam into a Bengali speaking Muslim majority areas. The Government should take, stringent measure to the identification of illegal migration with the help of local people and deportation of illegal immigration to the Bangladesh. Border fencing with Bangladesh should be complete in full swing. The implementation of the Illegal Migrants Determination by Tribunal (IMDI) act, 1983 created a complicated situation in Assam. Therefore, IMDT act should be repealed.

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N.B.- UG 5th Sem(H) Students: *Dolly Rajbongshi, Dharmendra Patowary, Bistirna Prantar Borah, Bappy Nath, Sobik Mandal, Nikhar Das, Bitusmita Kalita, James Mashood Ilahi, Karishma Basumatary, Rebika Dhar, Tapashri Nath, Nabajit Kalita, Deepjyoti Kalita, Aditya Prakash, Sonngaisem Singsit, Anjan Dahal, Rohit Kumar Choudhary, Sibangi Bhowmick, Binita Kumari, Juri Basumatary, Farheen Ahmed, Nikita Ghosh, Ishika Bhattacharjee, Hrishikesh Banik, Badal Basumatary, Bhabandao Hojai, Mairingdao Nunisa, Madhusmita Das, Nandini Das.*

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Social Issues and Challenges : Attitude of Youngsters Towards Dowry

UG 1st Semester (2021-202

Abstract

The custom of dowry is most common in cultures that are strongly patrilineal and th expect women to reside with their husband's family. Disputes related to dowry sometim result in violence against women, including killings and acid attacks. The ongoing reali of dowry-related violence is an example of what can happen when women are treated property.In this project, we tried to collect and gather the views of youngsters regardi this worldwide issue and make out certain assumptions on it. We even attempted to thro light on the various problems and effects on the societies where dowry system has bee prevailing since a long time.Positive result was found after conducting an online surv which is the base of the study.

Keywords: Dowry, Violence, Challenges.

Introduction

The dowry system in India refers to the durable goods, cash, and real or movable property that the bride's family gives to the groom, his parents and his relatives as a condition of the marriage. Dowry is essentially in the nature of a payment in cash or some kind of gifts given to the groom's family along with the bride and includes cash, jewelry, utensils, vehicles and other household items that help the newlyweds set up their home. Dowry is referred to as 'Dahej' in Arabic. In thefar eastern parts of India, dowry is called 'Aaunnpot'. The dowry system can put great financial burden on the bride's family. In some cases, the dowry syste leads to crime against women, ranging fro emotional abuse and injury to even deaths. Th payment of dowry has long been prohibited und specific Indian laws including the Dowry Prohibiti Act 1961 and subsequently by Sections 304B an 498A of the Indian Penal Code.

Statement of the Problem

The problem of dowry has become a gre problem for our society. We cannot set it aside Everybody is affected by this problem. Nearl all classes of people irrespective of their religio

or caste on their economic condition are affected by this barbarous practice. This evil has destroyed the married life of many girls. It is necessary to know that how much impact does education has on dowry system. Is there any effect of education on the attitude of youngsters towards dowry system? Therefore, we have taken a survey to find this out by ourselves. We have not come across any such study which deals purely with the attitude of youngsters towards dowry system. In this study we tried to take out the views and thoughts of the present generation on dowry as it are one of the issues of our country.

Objectives

1. To know the views of educated youngsters towards dowry
2. To promote marital and family harmony.
3. To effectively work for creating a dowry free society.
4. To create awareness about the present cruelty/dowry/harassment related laws and their damaging effects on the family.
5. To safeguard integrity of Indian families.

Data Source and Methodology

The article on 'Attitude of Youngsters towards Dowry', emerged out of several discussions with the people and painstaking research. Primary source of research technique was used in the survey based on the research topic. A questionnaire covering the different aspects of the study was drawn up. Different books also helped in providing vital information on the article. Distinct individual viewpoints have also been mentioned in the survey conducted using primary method of methodological approach. Internet, a secondary source has been one of the major sources of information. Books, travelogues, government websites, extracts from articles, etc. have all been important tools in collecting detailed information for the article.

Findings

On the basis of the survey we conducted through online mode the following data has been found:

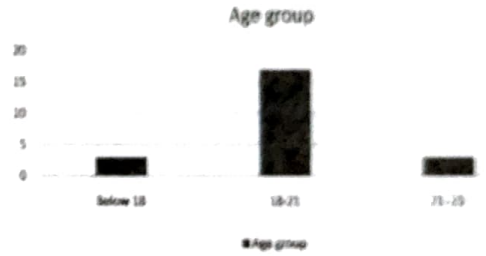

Fig. 1 Age Group of the Sample Population

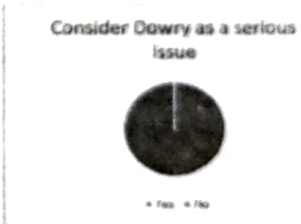

Fig.2 Pie Graph showing the % of respondents agreeing dowry as a serious issue

The above pie chart shows the votes of respondents if they consider dowry as a serious issue or not. We have found out that all of the respondents find dowry as a major issue. It implies that the new generation is strictly against dowry and are not in favour of it.

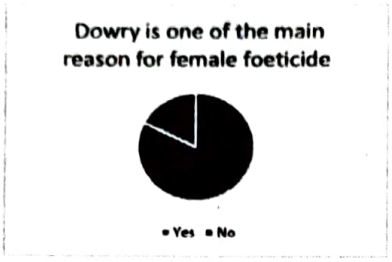

Fig.3 Pie Graph depicting the % of Respondents on Dowry and Female foeticide

Most of the youngsters who responded considers dowry as one of the main reasons for female foeticide whereas very few considers it not to be the reason for female foeticide.

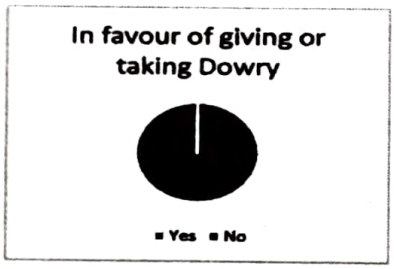

Fig.4 Pie Graph Showing the % of Respondents agreeing whether or not they support taking Dowry

The respondents were asked if they are in favour of giving or taking dowry, all of the respondents voted for 'No' in their answer which means they don't support this practice.

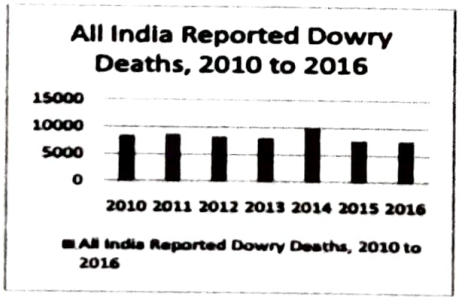

Fig.5 Graph showing All India reported Dowry Death between 2010-2016

As per the above report it can be observed that the ratio of death is slightly decreasing

As our topic focuses on the views of educate youngsters, the above graph shows the ag group of the respondents.

Conclusion

On the basis of the analysis of above study may be concluded that youngsters diffe significantly in attitude towards dowry systen In the study we found the youth have more o less same attitude towards dowry systen Dowry system is a system which disrupts th harmony in society. This system has its root i the psyche of society. That is why; it is ver difficult to find out its solution to remove. Fo its eradication, a lot of research work an awareness programs are being carried out i the societies. The college going students ar such youth whose attitude towards dowr system accounts significant factor in th promotion and demotion of it. On the basis o our study, we can understand that most of th youngsters are completely against dowry an do not support the same. Education has its grea impact and it can be seen through the view of the youngsters that how they are strictl against the practice of dowry and are no supporting it at any cost. People are well awar that taking dowry is a crime and is a punishabl offense. We can surely expect a better futur as the new generation has come out of suc evil practices and are not going to repeat it. I the present investigation an attempt has bee made to explore the attitude of youngster against dowry system. So as to seen th various reasons behind it. The result might b

useful for us to know the future scenario of dowry system and it may be fruitful for the youngsters to promote harmony in society.

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N.B.- UG 1st Semester Students: *Maitree Das, Srestha Chowdhury, Bipasha Banik, Abhijit Das, Shikha Moni Mahanta, Tamanna Pandit, Rahul Thakuria, Surabhi Nath, Sowmick Deb, Abhijit Deka, Sneha Kar, Noobloon Marifa, Lakhi Dey, Mintu Barman, Ankita Debnath, Dipjyoti Boro, Tanmoy Das, Bishal Chakraborty, Jintu Deka, Shimlee Roy, Tridisha Thakuria, Taniur Ahmed Laskar, Sneha Paul, Sagar Sarkar, Swapneel Bhadra, Hitikesh Nath, Bhaswati Baishya, Dhritisikha Saikia, Dimpi Soud, Arunava Priam Goswami, Nandita Baishya, Santona Biswas, Shivangi Talukdar*

Analysis of Land Use and Land Cover Change in Manipur, India

Monika Gog
Assistant Profess

Abstract

Land use and Land cover (LULC) change has become the prime concern in managemer and monitoring of natural resources and environmental changes. Natural landscape ha been massively altered due to anthropogenic activities. The state of Manipur is sufferin from heavy loss of forest cover consequent upon massive clearance of forest for cultivatio and developmental works. Besides, the rapidly expanding population and their growin demand for resources, coupled with unsound management practices have exerted enormou pressure on land cover, leading to degradation of natural landscape. The magnitud variety and the spatial variability of the land use/land cover changes taking place in th state have been identified during 2001-2021. In this study satellite images and unsupervise classification was used to assess LULC changesin the state and maps for the year 200 and 2021 were prepared with the help GIS (Geographic Information System) Software lik ArcGIS. This paper will enlighten the recent pattern of land use and land cover changes i Manipur. Hence, sound management and planning of natural landscape is of paramoun importance to avoid degradation of natural landscape.

Keywords: Land use and Land cover (LULC), Manipur, Natural landscape, Degradation

Introduction

With the march towards industrialization and urbanization the needs of human being for goods and services have been perpetually raising upward in such a way that the face of the earth has been altered with the use of modern machinery and techniques to harness the benefits of natural resources from the environment. The utilization of land resource give rise to "land use" which varies dependin upon the purpose it serves, such as provisio for shelter, food production, recreation extraction and processing of mate ials, and other natural resources of the land. "Land cover" refers to the surface cover of the

ground-vegetation, water, bare soil and artificial structures etc. In other words land use and land cover implies the change in the quantitative areal extent i.e., increase or decrease of a given type of land use and land cover respectively.

Land use and land cover (LULC) change has been the prominent form of global environmental change as it occurs at temporal and spatial scales. These changes help to monitor and manage the health of our environment and its resources. In recent times, the increasing anthropogenic activities has put enormous pressure on the existing natural resources which resulted in reduction of vital resources like forest, water and soil as they are being replaced by built up areas. LULC change has led to the degradation of environment and it also influences many other changes as loss in vegetation in turn has effect on climate change, loss of biodiversity, reduction in the quality of air, change in hydrological regimes and more to name. The LULC change is alarming and can significantly impact the local, regional and global environment.

LULC information is utilized to evaluate and detect the changing pattern in LULC. A Comprehensive understanding of land dynamics requires the detection of LULC change. In this regard, Remote sensing (RS) and GIS have long been recognized as an effective, essential and powerful tools in determining LULC changes at different spatial scales. With the development of RS and GIS techniques, LULC mapping has become a detailed and useful way to advance the choice of areas for different uses. In this paper analysis of LULC change detection in the state of Manipur is illustrated with the help of Geospatial tool. Loss of forest cover in the state particularly in Hill districts of Churachandpur, Tamenglong, Senapati, Chandel and Ukhrul have been alarming due to extensive felling of trees mainly by the tribal population to carry out shifting cultivation and for developmental works such as construction of railways, highways etc. Besides, the dependence of people on forest for the socio-economic and socio-cultural context and forest fire adds to another cause for the decline in forest cover. Some portion of water bodies in Manipur has been converted into agricultural field and climate change has contributed to the decline of water bodies. Forest and water resources are the two vital component of the environment essential for the smooth functioning of an ecosystem, forest helps to regulate and normalize the climate whereas water regulates the hydrological cycle and it helps to quest the thirst of living being which is essential for the survival of living being on the planet earth. Therefore, it becomes necessary to have a look at the rate of change of LULC so that resources can be properly monitored and managed to avoid the cost of extinction of vital resources of our environment.

Study Area

Thestudy area lies between latitude 23°83'N to 25°68'N and 93°3'E to 94°78'E longitude. The capital of Manipur is Imphal which lies in an oval-shaped valley of approximately 2,000 square kilometres surrounded by Blue Mountains, at an elevation of 790 m above sea

level. The total area covered by the state is 22,327 square kilometres. Manipur has moderate climate as the mountain ranges prevents the entering of cold winds from the north.

The Indian states of Nagaland, Mizoram, Assam and the Myanmar country border the state of Manipur towards its north, south, west and east respectively. The state has four major river basins: the Barak River Valley to the west, the Manipur River Basin in Central Manipur, the Yu River Basin in the east, and a portion of the Lanye River Basin in the north. The Barak River, the largest of Manipur, originates in the Manipur Hills and is joined by numerous other tributaries. Most of the rivers in the valley area are in the mature stage and therefore deposit their sediment load in the Loktak lake whereas rivers in the hilly terrain are in youth stage because of the hilly terrain through which it flows and therefore they have high corrosive power and become turbulent in the rainy season.

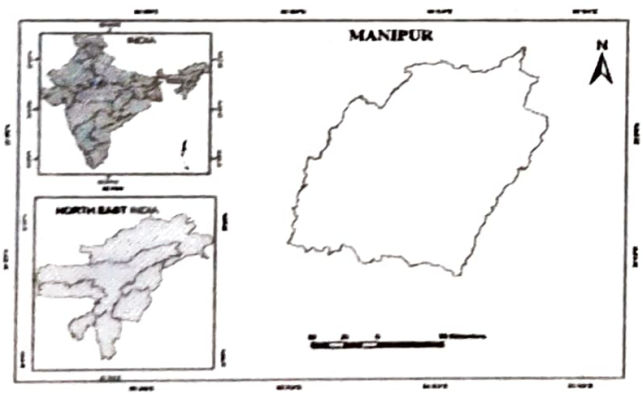

Fig. 1 Location Map of the Study Area

Manipur has two distinct physical regions: rugged hills and narrow valleys and the other one is characterized by flat plain. The soil of the state is categorized into two main type that is the red ferruginous soil in the hill area prone to erosion leading to the formation o gullies and barren rock surface and the alluviu located in the valley region. Manipur receive an average annual rainfall of 57.78 inch between April and mid-October. The maximum temperature of the state during summer month is 32°C and the coldest month is January, and the warmest is July. Climate is influenced large by the topography of the state.

Objectives

i. To know about the LULC pattern o Manipur.

ii. To produce LULC map of Manipur fo the year 2001 and 2021 in order to detec the LULC change.

Database and Methodology

LULC maps were prepared using GIS software (ArcGIS) in the following manner Satellite imagery of the study area for the year 2001 and 2021 was downloaded from Earth explorer. Two satellite imageries for each of the respective year (2001 and 2021) were merged in order to handle the overlapping raster dataset edges to form single raster dataset by mosaicking them together. Thereafter, clip tool was used to delineate the boundary of the study area (Manipur). Subsequently, unsupervised classification was done to assess the change in land use and land cover (LULC) of the study area. Four LULC classes were identified which include water body, forest cover, settlement, degraded forest

and thereafter area for each of the LULC classes were calculated using raster calculator in GIS software like ArcGIS. Bar diagram exhibiting LULC was prepared using MS Excel. Research articles, Journals, books were thoroughly reviewed to develop better insight of the topic.

Results and Discussion

The land use and land cover changes in the state of Manipur is prominently the outcome of anthropogenic activities. To detect the change in the spatial and temporal scale of LULC in the state satellite imagery derived maps were prepared for the year 2001 and 2021. A comparison between the two years gives a vivid picture of the alteration in the areal extent of "land cover" into "land use". From figure 9 and figure 10, it is evident that the share of LULC classes: water body, forest cover, settlement and degraded forest changed significantly from 2001 to 2021 in areal extent but the share of forest cover has been decline considerably from 15098.7 sq. km to 9283.82

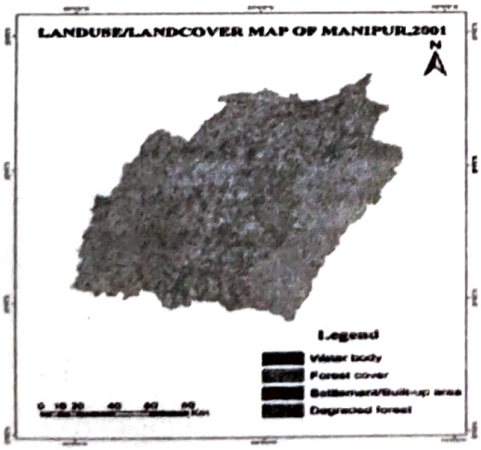

Fig. 2 Land Use Land Cover, 2001

Table 1 Manipur Land use / Land cover, 2001

LULC	Area in km2	%
Water Body	1352.9	6.1
Forest Cover	15098.79	68.40
Settlement	4538.06	20.55
Degraded Forest	1084.27	4.9
Total	22074.26	100

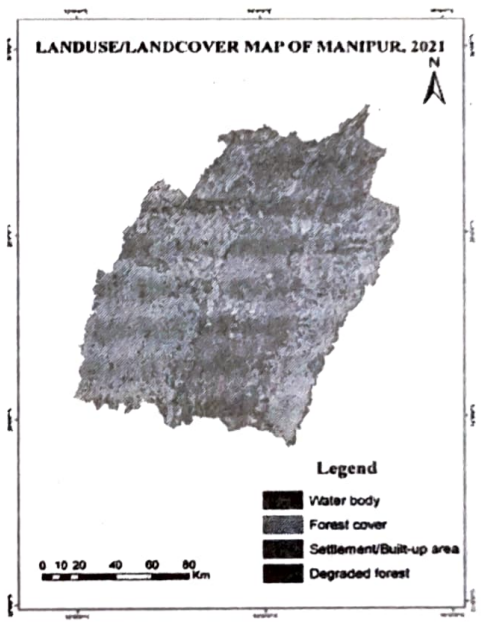

Fig. 3 Land Use and Land Cover, 2021

Table 2 : Manipur Land use and Land cover, 2021

LULC	Area in km2	%
Water Body	452.03	2
Forest Cover	9283.82	41.61
Settlement	6472.06	29
Degraded Forest	6100.35	27.34
Total	22308.26	100

sq. km in 2001 and 2021respectively and is replaced by built-up area (4538.06 sq. km to 6472.06 sq.km in 2021).

Massive clearance of forest is the result of Jhum cultivation, mostly done in the dense forest to sustain the majority of tribal population. The impact of extensive felling of tress is enormous as some of the areas of Hill districts were transformed to exposed rocky surfaces, habitats of the species were uprooted and they became homeless which further threaten the tag of North-east India as one of the biodiversity hotspot of the world.

Recently, the extensive felling of trees for poppy cultivation and for developmental works have significantly reduced the area of forest cover in the state particularly Hill districts of Churachandpur, Tamenglong, Senapati, Chandel and Ukhrl. But the maximum loss of green cover is visible in Churachandpur i.e., 250 sq.km in 2017-1018. Conversion of large forest cover area into railway lines, roads especially PMGYS (Pradhan Mantri Gram Sadak Yojana) roads, forest fire, timber logging and felling of tress for firewood were other factors. Churachandpur and Tamenglong are extremely fire prone areas which further contribute to decrease in forest cover area. One of the most affected district due to forest fire was Ukhrul district in 2018-2019, also the people use fire in order to burn the forest waste for farming purpose which results in outbreak of fire during dry season. Forest fire remains a serious threat to forest resources and wetland.

Population is growing rapidly in the state of Manipur due to large scale immigration, improvement in health and hygiene condition and in search of economic opportunities peopl move to large cities like Imphal seeking to tak advantage of the socio-cultural and civi opportunities available in the state and the lifestyle, growing demands for goods an services are held responsible for degradatio of forest and water resources as forest ar being cleared for settlement purpose, industria setup, dam construction etc. A comparison o Table 1 and Table 2 shows the degradation o forest resources from1084.27 sq.km to 6100.3 sq.km from 2001-2021 respectively accountin for 5016.08 sq.km deterioration of forest cove which is of great concern. Nevertheless, th situation of expanding population is not fre from obstacles as the state is facing scarcit of water and unable to meet the wate requirements of the people. By observin Table 1 and Table 2 drastic decrease in th level of water accounting for 6.1% to 2% i 2001 and 2021 respectively can be easily detec The "heart" of the state, "Imphal" is staggerin due to shortage of drinking water as most o the rivers such as Leimakhong, Thongjaorok Iril etc. are getting dried up posing greates threat to agriculture which is the main stay o the majority of population in the state. Bot anthropogenic and natural factors ar contributing to shortage of drinking water bu the share of man-made factors such a construction of dams, deforestation in th catchment area (Churachandpur, Tamenglong Imphal west and east) and quarrying overrides the natural factors like deficit in pre-monsoo rainfall is worsening the extent of water crisi problem day by day and the price for buyin the drinking water has doubled in the state Water level of the Singda dam an importan dam supplying water to vast areas has dropped

drastically and because of this the water supply from the tap to the urban areas, especially to the Imphal West district is affected which is of great concern.

Figure 2, clearly shows the change in LULC of the state for the four classes that is water body, forest cover, settlement/built-up area and degraded forest. Among these the water and forest resource of the state has declined considerably and is dominated by settlement/ built-up area and degraded forest consequent upon anthropogenic activities.

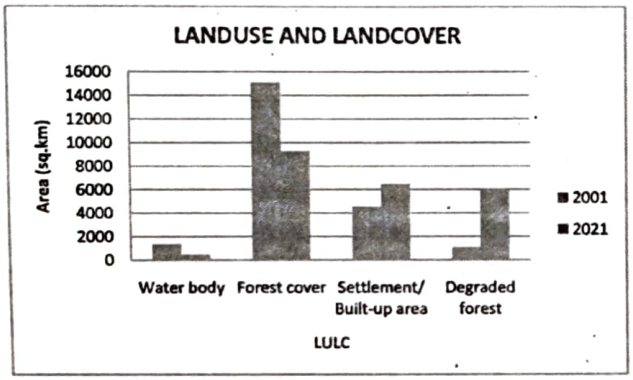

Fig. 4 Land Use and Land Cover Change

Land use and land cover (LULC) throws light on the transformation of the land from one type of use to another type. It gives information whether the change is beneficial or detrimental to the environment. LULC give guidance to manage and monitor the health of natural resources and remote sensing imagery and GIS has facilitated the task. Forest resource (68.40% to 41.61% in 2001 and 2021 respectively) and water resource (6.1% to 2% in 2001 and 2021 respectively), the most vital resource of the planet earth is declining considerably in the state of Manipur and is being rapidly replaced by settlement/built-up area (20.55% to 29% in 2001 and 2021) and degraded forest (4.9% to 27.34% in 2001 and 2021)which is of great concern and if the current trend continues unabated, the natural resources specifically the forest and water will become extinct. The effect of the forces responsible for such drastic change in the prevalent land use and land cover of the state can be kept under control or minimized through adaptation of proper management strategies and the people of the state must be encouraged to adapt water harvesting method and afforestation. Besides, the government must adopt proper land use planning policy for sustainable and judicious use of resources of the state of Manipur.

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Soil Texture Distribution of Assam

Ambika Ra
Assistant Profes

Abstract

Soil texture measures the water holding, water percolation, soil fertility, and the composition of an area. Soil is an important component of agricultural productivity, combination of crop of an area. Assam is covered by almost floodplain areas and so spotted by hill locks. Almost all areas covered by the loamy soils. Minimum area cove by the sandy soil and the medium area covered by the clay soil. Sandy soils are of known as light soils due to their high proportion of sand and little clay. Loamy is full rich soil. Loamy soil is composed of loam. Clay types of soil that contains a high percenta of fine particles and colloidal substance and becomes sticky when wet. With the help soil gridded and using the geo-spatial tools the present study area has been analyze

Keywords: Soil Texture, Loamy, Sandy, Clay, Remote Sensing

Introduction

Soil texture is one of the most stable properties and a useful index of several other properties that determine the agricultural potential of soil. The framework of the soil consists principally of mineral and organic particles of various sizes. Soil textures refer to the sizes that make up the soil and proportion of particle sizes determines a soil texture (Gabler, 2009). Particle size distribution (PSD) of soils is one of the fundamental parameters permanently used in soil science (Brzeziñska et al., 2011; Joó et al., 2010; Nosalewicz and Nosalewicz, 2011; S³awiñski et al., 2011; Tóth et al., 200 The gridded soil data successfully analyzed w the help of spatial analysis tool.

Methodology

The present study area analyzed based secondary data and evaluate with the help ArcGIS software. The soil gridded data coll from the ISRIC world soil informatio websi For the analysis purpose has been use the S data spatial resolution of 250 meters and t soil properties mainly sandy, loamy and clay

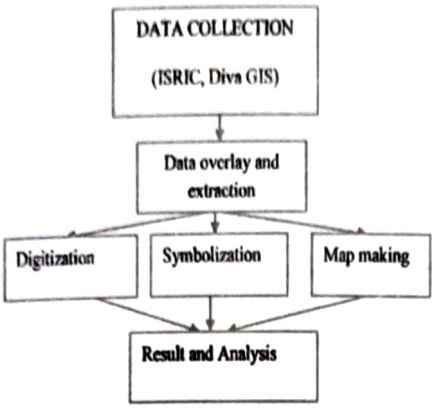

Fig. 1 Flow chart

Study Area

Assam is a state in north-eastern India, south of the eastern Himalayas along the Brahmaputra and Barak river valleys. Assam extent from 89°53'79"N latitude to 95°57' 40" N latitude and 26°42'15"E longitude to 28° 35'64"E longitude to Assam covers an area of 78,438 km. The state is bordered by Bhutan and Arunachal Pradesh to the north ; Nagaland and Manipur to the east; Meghalaya, Tripura, Mizoram and Bangladesh to the south and West Bengal to the west via the Siliguri corridor, a 22 kilometres wide strip of land that connects the state to the rest of India. Assam is a floodplain area and its criss - crossed by many tributaries.

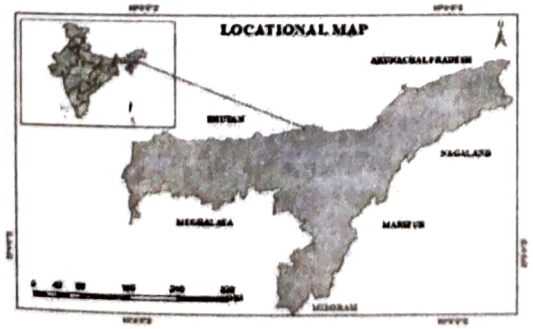

Fig. 2 Location Map

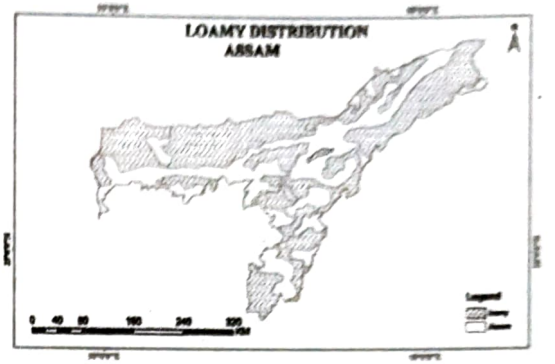

Fig. 3 Loamy Soil Distribution, Assam

Results and Discussion

The soils texture of Assam the resultant product of interaction of different soil forming factors and climate, vegetation and relief seem to have played the dominant role. Due to this complex interaction of these factors, several kinds of soils are developed which differ distinctly in morphological and physical and chemical properties. Such characteristics formed the basis for identifying and distinguishing the nature of soils and delineating the extent of different soils in the study area. Loamy type of soil is distributed almost entire study area. Loamy type of soil organic materials composition is very high, so it's good for cultivation. Sandy soil mainly found in the district of Dhemaji, Lakhimpur, Sonitpur, Golaghat, Nagaon, and Dhubri. Sandy soil is

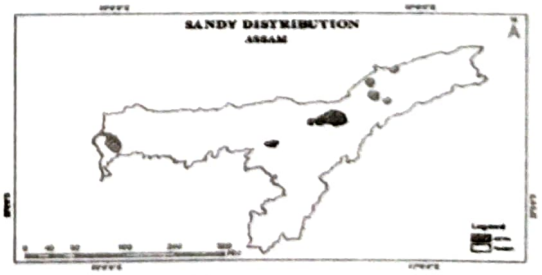

Fig.4 Sandy Soil Distribution, Assam

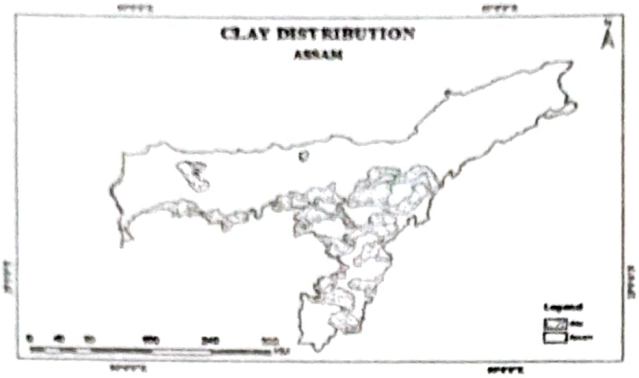

Fig.5 Clay Soil Distribution, Assam

very useful for the vegetable cultivation mainly for Rabi crops. Usually, the sandy soil found in the frequently flood affected areas. Significant characteristics of the soil are that water holding capacity is very less.Clay distribution mainly dominant in the districts of Cachar, Dima Hasao, Karbi-anglong, Nagaon, Golaghat, Morigaon, Darrang, Kamrup, Goalpara and Chirang districts. Clay type of soli is good for the paddy cultivation. Paddy cultivation required a lot of water and the clay type of soil water penetrate capacity is less.

Conclusion

It was concluded that soil texture and soil organic matter had influence on water capacity of the agricultural field. Soil has two properties, namely - physical and chemical. These properties include soil moisture, texture, etc. Soil texture plays an important role in crop cultivation. Soil distribution analysis is very important for the future development ar management of an area. For the prope utilization and land use purposes the so analysis distribution is fruitful and significan

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A Geo-Spatial Analysis on Sahala Wetland of Kaziranga National Park

Tasreena Nasreen
Assistant Professor

Abstract

Wetlands are one of the most productive ecosystems, comparable to tropical evergreen forests in the biosphere and play a significant role in the ecological sustainability of a region. They are an essential part of human civilization meeting many crucial needs for life on earth such as drinking water, protein production, water purification, energy, fodder, biodiversity, flood storage, transport, recreation, research-education, sinks and climate stabilizers. Compared to many other ecosystems, wetlands are one of the most productive habitats in the world, with greater species diversity nutrient recycling and niche specialization than most other ecosystems.Thus, proper measures are required for conservation of habitat and biodiversity at broad landscape level. Establishment of protected areas is necessary for promoting sustainable forest management and biodiversity. Protected area mapping is an important aspect of protected area management. It serves as baseline for ecological modeling and future monitoring and assessment. Advances in geospatial tools have further strengthened the mapping technique as it considers both temporal and spatial aspect of the landscape. The present study was carried out to detect the changes occurred in Sahala wetland of Kaziranga National Park using tools of remote sensing and GIS. The area is rich in both floral and faunal diversity and thus requires attention for conservation and restoration measures. The area was thus selected to map the landscape that will serve as baseline for further studies and future monitoring.

Keywords: Wetland Dynamics, Ecological Importance, National Park

Introduction

Wetlands are unique ecosystem having rich nutrient status and carrying capacities with immense production potential hence are important food and fodder producers for human and its related allies. Ecologically wetlands are of great significance for an area as they support

different food chains, regulate hydrological cycle, recharge ground water, trapping solar energy and provide shelter to large number of flora and fauna having great ecological and economical value.

Kaziranga National Park lies partly in Golaghat District and partly in Nagaon District of Assam with extension of 26°57'75" N to 93°17'11" E. It is a UNESCO world heritage site and a protected area in the northeast Indian state of Assam. Spreads across the floodplains of the Brahmaputra River, its forests, wetlands and grasslands are home to tigers, elephants and the world's largest population of Indian one-horned rhinoceroses. Ganges River dolphins swim in the park's waters. It's visited by many rare migratory birds, and gray pelicans roost near Kaziranga village. With an area of 430 Sq. kms along the river Brahmaputra on the North and the Karbi Anglong hills on the South. The National Highway 37 passes through the park area and tea estates, hemmed by table-top tea bushes.

The park is home to numerous wetlands and more than 250 seasonal water bodies, among which Sahala wetland is the largest located in the south- eastern part of the region with coordinates of 24°45'N - 93°33'E Sahala (16 in Assamese language) beel (lake) is a collection of 16 waterbodies that form this giant freshwater lake in Kaziranga. It plays an important role to regulate the natural habitat of Kaziranga National Park. Sahala wetland is the largest of Kaziranga's 92 perenni wetlands, and is known for migratory bird visi from around the globe and Rhino, Royal Beng Tiger, Asiatic Water Buffalo, Elephants, etc are some other important species whic nourishes the ecosystem of the park.

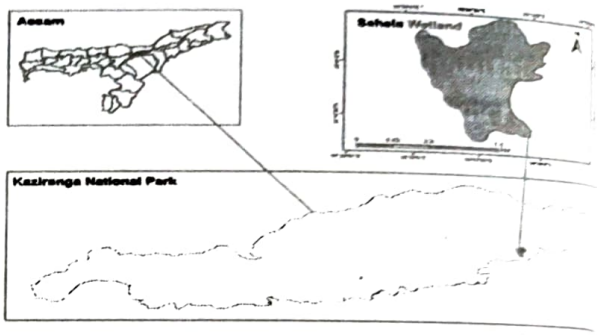

Fig. 1 Location Map of the Sahala Wetland, Kaziranga National Park

Data Source and Methodology

This study is based primarily on secondary dat collected from journals, newspaper articles, resources, etc. High resolution spatial data ha been derived from Google Earth for the yea 2003 and 2013 to support visual classificatio of features with ground corroboration. Fo historic spatial data, topographic map (1:50,00 surveyed in 1973 and published by Survey India was consulted. All the spatial data derive in the process are analyzed in GIS platform usin ArcGIS 10.4 software to assess tempor change occurred in the wetland environmen Subsequently reporting has been done.

Findings

Wetlands of Kaziranga National park are som of the major habitat for most of the world' water birds and key habitat for migrator

species. A larger population of park's water-birds and animals use Sahala wetlands as feeding and breeding grounds. Migratory water-birds use the wetland throughout their range which can sometimes literally be from pole to pole. The feeding, breeding and stop-over areas across and between continents that migratory birds depend on requires coordinated wetlands conservation efforts among many nations and Kaziranga is a greater example of it.

The national park is home of the world's most one-horned rhinos, has recorded with a total of 19,225 birds from 80 families belonging to 96 species of wetland birds as one of the highest for any wildlife preserve in India as per the second wetland bird count conducted by the Karizanga National Park official along with the Avian specialists in the month of January, 2020.

Four ranges: Agoratoli, Bagori, Burapahar and Kohora in which the second bird count was conducted, in which Out of the total 96 species, 85 comprising of nearly half of the total birds (9,924) were recorded in the area of Agoratoli Range because of the largest wetland of Kaziranga, Sahala is in this range and more than 34% of the birds counted were found in Sahala

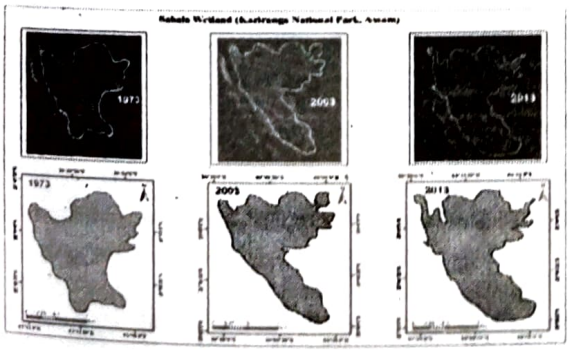

Fig. 2 Changes in Area of Sahala Wetland, Kaziranga National Park, Assam

wetland region. Not only bird species it attracts a good population of wild buffaloes, rhinos, elephants, deers and numerous aquatic species.

Sahala Beel, which continues to be the largest wetland in Kaziranga National Park despite area shrinkage of wetland and areas of short grasses due to siltation, and major impacts of climate changehas caused habitat loss, frequent flooding, temperature increase or desertification, affects patterns of migration, shortages of food, breeding place competence in the area. However, it is believed that over a span of more than 40 years Sahala wetland has merged itself from five- six smaller wetlands by the replenishment of huge floods of Kaziranga national park during monsoon season, which shows a positive change in the area ecologically. An area expansion can be observed in the wetland of about 39.06 hectares from the year 1973 to 2013(Table 1: Area of Sahala wetland, 1973-2013).

Table 1 Area of Sahala wetland, 1973-2013

Year	1973	2003	2013
Area in (ha)	208.33	201.48	246.39

Being an important freshwater supply for the inhabitants Sahala wetland is not only a largest one of the all wetlands of the national park, it is renowned as most ecologically significant wetland of Northeast India after DeeporBeel, a Ramsar site.

Sahala wetland shelters more than 30% of the resident birds of the Kaziranga, alongside migratory birds, bar-headed Goose, Gadwall,

Grey-headed Lapwing, Ruddy Shellduck, endangered wild buffaloes, Royal Bengal Tigers, etc.It is estimated (Wetlands in Asia, 1997) that about 20% of the known species of life rely directly or indirectly on this wetlands for their survival, as it is their primary and important seasonal habitat. In this regard despite being wetlands are exploited around the globe for better human civilization, Sahala wetland is an example of restoring a natural depression naturally, though seasonal variation can be observed in water level fluctuation, resulting in floods during monsoon seasons which roots habitat loss, death of mammals, and makeshift of species fooding and breeding areas. This wetland is yet to be restored and appreciate by the locals and authorities to minimize the erroneous consequences in the peak seasons.

Conclusion

Wetlands are unique, productive ecosystems where terrestrial and aquatic habitats meet. Wetlands play a critical role in maintaining many natural cycles and supporting a wide range of biodiversity. They purify and replenish our water, and provide the fish and rice that feed billions. They serve as a natural sponge against flooding and drought, protect our coastlines and help fight climate change. Bursting with biodiversity, wetlands are a vital means of storing carbon. SahalaWetland have tremendous ability to meet natural as well a cultural needs, it is underlain by aquifers wit a high potential for water supply and nutritio importance to balance the underlying unju ecosystem occurred over the years.Par effectiveness, however, depends on par management, monitoring, improving protecte area system design, and increasing local an national support.

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Application of Geo-Spatial Technology in Wildlife Tourism in Kaziranga National Park, Assam

Rebecca Kramsapi
Assistant Professor

Abstract

Kaziranga National Park is blessed with tourism resources and its potential to attract more tourists in the future due to rich wildlife specifically one horned rhinoceros and its lush green hills nearby. Unavailability of tourist information, scanty knowledge about its surrounding leads to poor management of eco-sensitive Park. This paper demonstrates the use of Geographical Information system (GIS) technology to determine the numbers of animals, tourist arrivals and wildlife viewing spots for proper tourism management in the study area. The base map of the study area is georeferenced and digitized by layer using ArcGis Software. GPS points were plotted using Google earth search engine and exported in GIS software for further integration.

Keywords: Tourism, Potential, GIS, Tourism Management.

Introduction

Wildlife tourism is build upon human interaction with non-domesticated animals in either the natural environment or in captivity like zoo, national park or sanctuary (Higginbottom K, 2004, Newsome et al.,2005). Historically, it is classified as non-consumptive such as viewing, photography and feeding, as well as those involve in killing or capturing animals particularly hunting in the natural environment and recreational fishing activities in the aquatic environment.

Wildlife management needs reliable information on the abundance of distribution of species and their habitats as well as threats (Jan de Leeuw et al., 2005). GIS is increasingly used for mapping wildlife density and distribution derived from ground or aerial survey observations (Butler et al. 1995; Said et al. 1997). GIS is a very useful tool for investigating tourism development that includes location, condition of the area, trend and changes, routing to and through the site, and patterns associated with resource use (Dye & Shaw,

2007). Remote Sensing (RS) and GIS applications play a very important role in ecotourism planning where geospatial technologies provide efficient tools for storing and manipulation and analyzing a great variety of data.

Objectives

The aim of this study is to demonstrate how GIS technology can be used to manage the study area. The specific objectives are:

1. To determine the number of wildlife and its tourist arrival in the study area
2. To identify suitable wildlife viewpoint through mapping

Data Source and Methodology:

This paper as a whole uses GIS to integrate spatial tourist information and spatial wildlife knowledge in space and eventually in time

Study Area

It lies between latitude 26°30'N to 26°45'N and longitude 93°08'E to 93°36'E. It has around 40 kilometres long (approx. 25 miles) and 13 kilometers (approx. 8 miles) broad. Initially it has 378.22 sq. km in which 51.14 km2 has been lost to erosion by the Brahmaputra. Some surrounding area has been added to offer.

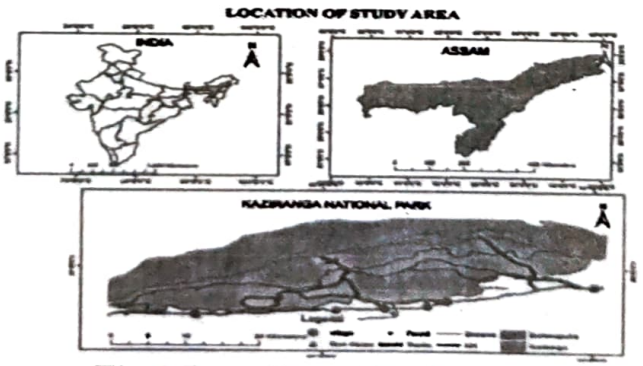

Fig.1 Location of Study Area

Results

Wildlife and Tourism

Kaziranga was first opened in 1937 for visit to see the richness of wildlife and since the has continues to attract millions of people fr all around the world. Wildlife play a major r in attracting millions of tourists from arou the world, a survey among the 300 visitors b national and international tourists w conducted by Mahanta P. (2017) presented table no.1 shows that 73.7% of the visit came to see wildlife in general and 20% see the endangered one-horned rhinocer Hence, a single wildlife species attracts 2 of the other animals. Other wildlife include major "Big Five" of the Park includ Rhinoceros, Royal Bengal Tiger, wild wa buffalo, Asian Elephant, Eastern Swamp d which attracts 93% of the visitors.

extensive habitat for growing population wildlife, so that during the flood season t animals can move safely to the hills areas Karbi Anglong district. The present bounda of the park is 429 sq.km. The entire area park is confined by the Brahmaputra River t forms the eastern & northern boundaries, a the Mora Diphlu that forges the southe boundary. The park area is divided into fi ranges, overseen by Range Forest Office The five ranges are the Burapahar (H Ghorakati), Western (HQ: Bagur), Centr (HQ: Kohora), Eastern (HQ: Agaratoli) a Northern (HQ: Biswanath). Each range

further sub-divided into beats, headed by a forester, and sub-beats, headed by a forest guard.

Table.1 The purpose of visiting KNP

Sl.no	Primary Reason	Frequency	Percent
1	A chance to see the one-horned rhino	60	20.0
2	Wildlife viewing in general	221	73.7
3	Landscape	6	2.0
4	Wilderness/remoteness	8	2.7
5	Trekking/Physical activity	1	.3
6	Local culture	1	.3
7	Opportunities	1	.3
8	Opportunities for solitude	2	.3
	Total	300	100.0

Source: Mahanta P. Kumar, 2014

The Kaziranga National Park is a prime wildlife tourism in North-East India and the various tourism activities are organized by the forest department. The Jeep safari and Elephant Safari are the means of transportation inside the park to explore the rich wildlife and sighting of the majestic's wild animals of the park.

Table.2 Inflow of Tourism to Kaziranga National Park

YEAR	INDIAN	FOREIGN	TOTAL
2009-10	105264	7580	112844
2010-11	112392	7447	119839
2011-12	117308	7521	124829
2012-13	93747	7418	101165
2013-14	1,19,289	6,922	1,26,211
2014-15	1,23,360	7,994	1,31,354
2015-16	56,42,950	26,320	56,69,270
2016-17	54,13,156	28,419	54,41,575.00
2017-18	59,34,791	31,739	59,66,530.00

Source: Directorate of Tourism, Assam, 2020

Wildlife

The Park is a home to various wild animals including the world largest population of Greater one horned Rhinoceros with a total of 1855. Wild Asiatic with a total population of 1666, 30 eastern gaur, 58 sambar. Kaziranga has the largest population of the Wild water buffalo anywhere accounting for about 57% of the world population. The One-Horned rhinoceros, Royal Bengal Tiger, Asian elephant, wild water buffalo and swamp deer are collectively known as 'Big Five' of Kaziranga Species

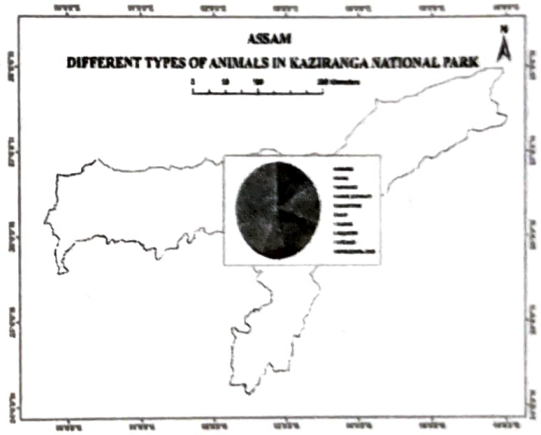

Fig.2 Types of Animals in Kaziranga

density in Kaziranga National park has been prepared also highlighting the percentage of animals in ArcGis software, the density map of animals has been prepared by total animals divided by the total area and represented by dot methods, one dot means 28 animals per sq. km. The circle highlighting different shapes and color represent the percentage of different species of animals to total animals.

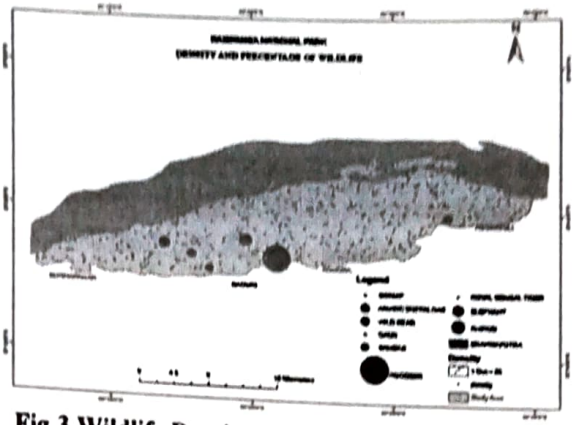

Fig 3 Wildlife Density in Kaziranga National Park

Wildlife Viewpoint

Tourist tend to watch to wildlife from any possible place or area whichever it is clear or closed enough to see the animals, but it is dangerous and be harmful for to tourist sometimes. The tourist managnment authority has selected viewpoint that been, randomly within the park and some veiwpoint along the National Highway.

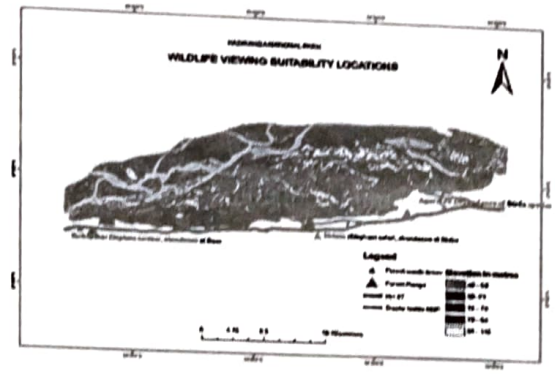

Fig. 4 Wildlife Viewing Suitability Locations

Conclusion

GIS techniques hold promises in testing the connections between types of knowledge that everyone recognizes as relevant for land planning and management. Tourism is an industry that includes different categories, place, culture, tradition etc that needs an effective tools that helps in effective decision making with the competitating economic, social and environmental demands of sustainable development in around the world globally, regionally and local.

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PART-II
DEPARTMENTAL PROFILE AND ACADEMIC

A Glimpse on Wall Magazine.....

Geopolitical Issues of India

Geopolitics is the analysis of geographic influences on power relationships in international relations. Geopolitical factors are factors involving geography and politics which affect borders that separate nations from one another. Geopolitical examples may include trade agreements, war treaties, border or territorial acknowledgements, climate agreements, and more. Geopolitics is the analysis of the interaction between, on the one hand, geographical settings and perspectives and, on the other, political processes, although these issues can be international as well as intra-national.

Some of the present geopolitical scenarios are described below:

* **Godavari Water Dispute :** Godavari is the largest rivers in the Deccan plateau. It originates in Nasik district of Maharashtra. The Godavari river basin is spread in Maharashtra, Madhya Pradesh, Karnataka, Orissa and Andhra Pradesh. While the commission was active in bringing the peaceful solution to the problem, many bilateral and trilateral agreements were reached in 1978-1979. Under the inter-state agreement, while other concerned states are free to use the waters of Godavari and its subsidiary rivers, Andhra Pradesh can use Godavari waters only after Paithan. Similarly, water sharing of certain subsidiary rivers of Godavari has been mentioned in bilateral agreements. There are provisions for some projects such as Inchampalli and Palavaram. of this, 45 billion cubic feet should be diverted by Andhra Pradesh while the remaining 35 billion cubic feet by Karnataka and Maharashtra. Despite the agreement, there have been minor disputes regarding the sharing of Godavari River.

* **Krishna Water Dispute :** The sharing of Krishna waters is a contentious issue between Andhra Pradesh and Karnataka. After independence Karnataka began to utilize more and more Krishna water, leading to statewide resentment in Andhra Pradesh. The Bachawat tribunal set up in 1969 to find a solution to the dispute of sharing Krishna

waters. However, the award of the tribunal could not settle the dispute. Another tribunal was constituted in 2004. This Krishna Water Disputes Tribunal (KWDT) passed orders in June 2006. The tribunal in its hearing held in September and October 2006 has framed 29 issues for adjudication of the dispute before it . Further hearings are continuing.

* **Sutlej-Ravi-Beas Controversy :** Disputes over sharing the Sutlej-Ravi-Beas water have been mainly between Punjab and Haryana. After Independence, an agreement was reached between India and Pakistan for sharing of the Indus waters. Under the agreement, Indus, Jhelum and Chenub waters are to be used by Pakistan, while Sutlej, Ravi and Beas waters were left to be used by India. There was no water dispute in the united Punjab. When the state of Haryana was carved out of Punjab in 1966, Haryana demanded from Punjab its share of water. Thus lead to dispute between the two states. Punjab filed a write petition against the tribunal in the Supreme Court in 1976. The commission recommended 50 lakh acre feet of water to Punjab and 38.30 lakh acre feet to Haryana.

  In all the agreements reached out and tribunal and commission set up so far, the centre has played the role of a meditor. Still the dispute remains to be solved. Punjab has declared the January 2002 judgement of the Supreme Court regarding the canal as anti-Punjab.

* **Cauvery River Dispute :** The Cauvery River is a perennial river that originates in Karnataka, and flows through Tamil Nadu into Puducherry and merges with the Bay of Bengal. It is Tamil Nadu's only perennial river and currently the source of over 70% of canal Irrigation that supplies water to the state's agricultural land. Equitable and timely sharing of water by Karnataka to Tamil Nadu is vital to both agricultural and drinking water. For decades, the two states have fought over the timeliness, frequency and quantity of water. On 16th February, 2018, a special bench of Chief Justice of India, Dipak Misra delivered the verdict on the issue, largely upholding the water sharing agreement finalized by the Cauvery Water Dispute Tribunal on February, 2007.

* **Indus Waters Treaty :** The Indus Water Treaty(IWT) deals with river Indus and its five tributaries, which are classified in 2 categories:

Eastern rivers:	Western rivers:
1. Sutlej	1. Jhelum
2. Beas	2. Chenub
3. Ravi	3. Indus

According to the treaty, all the water of eastern river shall be available for unrestricted use in India. India should let unrestricted flow of water from western rivers to Pakistan. It doesn't mean that India can't use western river water. The treaty says that India can use the water in "non-consumptive" needs such as for irrigation, storage and even for electricity production. The treaty allocates 80% of water from the six rivers to Pakistan. Though indus originates from Tibet, China has been kept out of the treaty.

* **Sutlej Yamuna Link Dispute :** Sutlej Yamuna Link (SYL) canal envisages delivering Haryana's share of Ravi-Beas waters. Sort on July 12, 2004. When it unanimously passed the Punjab Termination of Agreements Biu, 2004, annulling the 1981 agreement on sharing of the waters of Sutlej, Ravi and Beas rivers between Punjab, Haryana and Rajasthan.

The Bill was passed to make ineffective the June 4, 2004 order of the Supreme Court directing the centre to carry out its action plan for the construction of the 121 Km of Punjab portion of the Sutlej Yamuna Link canal .The apex court's decision was based on the 1981 agreement. The Punjab legislation has struck at the heart of the federal polity and has led to a serious political and constitutional crisis in the country.

* **Son Rihand Water Dispute :** The Son -Rihand Water Dispute involves three states- Bihar, Uttar Pradesh and Madhya Pradesh. Bihar has been opposed to this agreement right from the beginning. Under the agreement, the entire Rihand waters had been allocated to Bihar, but the Singrauli based Nation Thermal Power Corporation (NTPC) plant and the utter Pradesh government has been utilizing water in the Rihand reservoir.

* **India-Bangladesh Border Issue :** The Bangladesh- India border, is an International border running between Bangladesh and India. The border is used as a route for smuggling livestock, food items, medicines and drugs from Bangladesh. Moreover, illegal immigrants crossing from Bangladesh into India, a controversial shoot-on sight policy has been enforced by the Indian border patrols. Over Nine Hundred Bangladeshis were killed by the BSF along the border till 2009.

* **Assam Nagaland Conflict :** Ever since Nagaland was carved out of Assam's Naga Hills district in 1963, Nagaland has been demanding some portions that hill state believes 'Historically' belongs to it. Assam and Nagaland shares a 434 km boundary. According to

Assam Government, Nagaland has been encroaching upon over 66,000 hectares in Sivasagar, Golaghat, Jorhat and Karbi Anglong districts. There has been a series of violent incidents since Nagaland was created. Two major incidents took place in 1979 and 1985, leaving atleast 100 persons dead between them. In March, 1981.

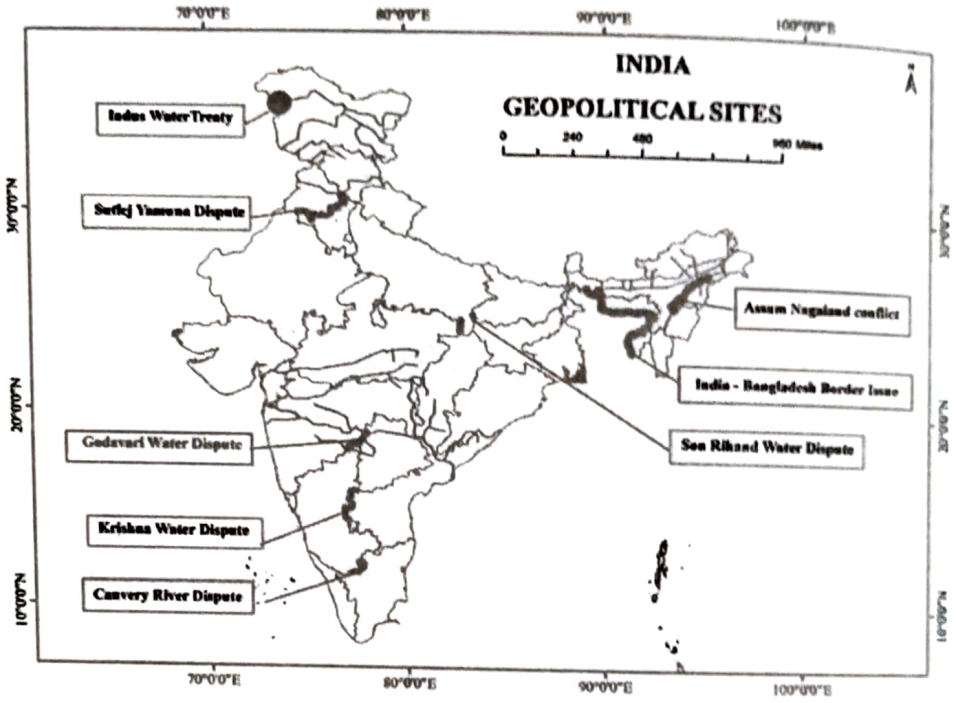


Fig. 1 Some of the Conflict Zones of India

Prepared by : Department of Geography

WORLD ENVIRONMENT DAY THEMES (1974-2022)

Dr. Niranjan Bhattacharjee
HoD, Department of Geography

2022	-	*Only One Earth*
2021	-	*Ecosystem Restoration*
2020	-	*Celebrate Biodiversity*
2019	-	*Air Pollution*
2018	-	*Beat Plastic Pollution*
2017	-	*Connecting People to Nature*
2016	-	*Go Wild For Life*
2015	-	*Seven Billion Dreams. One Planet.*
2014	-	*Raise Your Voices, Not the Sea Level*
2013	-	*Think. Eat. Save.*
2012	-	*Green Economy: Does it Include You?*
2011	-	*Forests - Nature At Your Service'.*
2010	-	*Biodiversity - Ecosystems Management and Green Economy*
2009	-	*Your Planet Needs You - Unite to Combat Climate Change*
2008	-	*Kick The Habit - Towards A Low Carbon Economy*
2007	-	*Melting Ice - A Hot Topic?*
2006	-	*Deserts and Desertification - Don't Desert Drylands!*
2005	-	*Green City*
2004	-	*Environment for Development*
2003	-	*Water - Two Billion People are Dying for It!*
2002	-	*Give Earth a Chance*
2001	-	*Connect with the World Wide Web of Life*

2000	-	*The Environment Millennium - Time to Act*
1999	-	*Our Earth - Our Future - Just Save It!*
1998	-	*For Life on Earth - Save Our Seas*
1997	-	*For Life on Earth*
1996	-	*Our Earth, Our Habitat, Our Home*
1995	-	*We the Peoples: United for the Global Environment*
1994	-	*One Earth One Family*
1993	-	*Poverty and the Environment - Breaking the Vicious Circle*
1992	-	*Only One Earth, Care and Share*
1991	-	*Climate Change. Need for Global Partnership*
1990	-	*Children and the Environment*
1989	-	*Global Warming; Global Warning*
1988	-	*When People Put the Environment First, Development Will Last*
1987	-	*Environment and Shelter: More Than A Roof*
1986	-	*A Tree for Peace*
1985	-	*Youth: Population and the Environment*
1984	-	*Desertification*
1983	-	*Managing and Disposing Hazardous Waste: Acid Rain and Energy*
1982	-	*Ten Years After Stockholm (Renewal of Environmental Concerns)*
1981	-	*Ground Water; Toxic Chemicals in Human Food Chains*
1980	-	*A New Challenge for the New Decade: Development Without Destructio*
1979	-	*Only One Future for Our Children - Development Without Destruction*
1978	-	*Development Without Destruction*
1977	-	*Ozone Layer Environmental Concern; Lands Loss and Soil Degradation*
1976	-	*Water: Vital Resource for Life*
1975	-	*Human Settlements*
1974	-	*Only One Earth*

Source : Collected from Various Sources

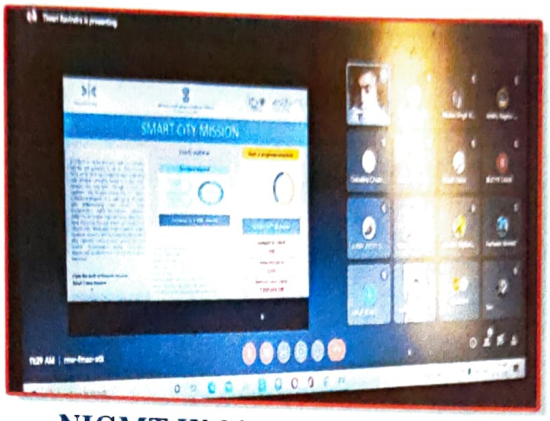
GEOGRAPHY DEPARTMENT AT A GLANCE

Date of Establishment	:	1st August 1982
Introduction of Higher Secondary Course in Geography	:	1982-83
Introduction of Degree General Course in Geography	:	1985-86
Introduction of Degree Major Course in Geography	:	1996-97
Obtained Recognition of Research LAB by Gauhati University	:	2011-12
Introduction of Certificate/Diploma in Geoinformatics		
-DGPS Aided Land Survey Course	:	2013-14 and 2022
Introduction of Post Graduate Course in Geography	:	August 2017

Administrative Building, Pandu College

Department of Geography, Pandu College

DEPARTMENTAL ACADEMIC CONVERSE...



NIGMT Webinar, 21-07-20

Seminar Presentation by the PG 1st Sem. Students, 2021

Presentation 1st Sem. UG, 2021

Students at GIS lab, 2021

Achievements and Extension Activities...

Science Exhibition 1st March, 2021 and Secured 2nd Position

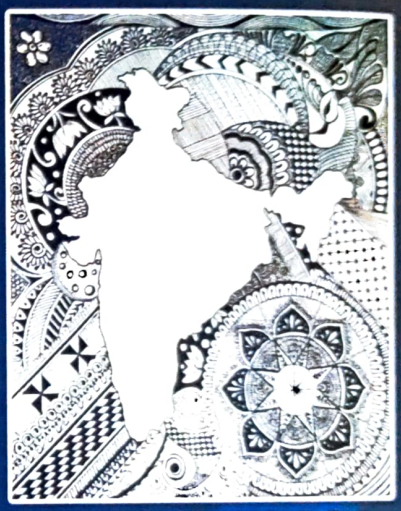
Departmental Magazine Inauguration
Prof. Ashok Kumar Bora, Prof. Ratneshwar
Prof. Abani Kumar Bhagawati, Gauhati Uni

Faculty Members, 2021

Art By Debolina Chakraborty (M.A. 1st Sem)

Art By Kuheli Das (M.A. 1st Sem)

Mighty Brahmaputra River Captured by Nishanta Saikia (M.A. 1st Sem)



Art By Banashri Das (M.Sc. 1st Sem)

An outing with faculty members at Bhutan Chowki