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CONTENTS

Sr. No.	Topic	Page No.
1	PRIVATISATION OF EDUCATION : ISSUES AND CHALLENGES Dr. N. Jayalakshmi	1-5
2	STUDY OF MODERN HISTORY OF MODERN INDIAN SOCIETY AND CULTURE : METHODS AND PERSPECTIVES Dr. Dolly Boruah	6-17
3	RHETORICS OF FEMINIST SCREEN THEORY AS SEEN IN RECENT BOLLYWOOD CONSTRUCTS Dr. Machunwangliu Kamei	18-21
4	A GLOBAL PERSPECTIVE ON FEMINIST ETHICS : CONVERGENCE, DIVERGENCE AND PLURALITY Swati Sengupta	22-25
5	EVOLUTION OF BUDDHISM IN ASSAM : A CASE STUDY OF TEMPLE CITY OF HAJO Dr. Nayan Kalita	26-29
6	A BINARY LOGISTIC REGRESSION MODEL, ANALYSE AND IMPACT OF WORKFORCE'S CHOICE OF RURAL NON-FARM EMPLOYMENT : A CASE STUDY OF ASSAMESE DISTRICT OF DIBRUGARH Dr. Dipali Neog	30-43
7	AN INSIGHT INTO THE UNEMPLOYMENT SCENARIO AND POLICIES TAKEN IN INDIA DURING COVID-19 Dr. Nazneen Ara Hoque, Moonmoon Gogoi, Saddam Hussain, Bikram Pegu	44-51
8	WOMEN EMPOWERMENT- A STEPPING STONE TOWARDS FREEDOM OF WOMEN IN THE CONTEXT OF SWAMI VIVEKANANDA Rinku Deka	52-58
9	IMPACT OF HEALTH CARE AVAILABILITY AND SOCIO-ECONOMIC STATUS ON CHILD MORBIDITY : A CASE STUDY OF ASSAM BASED ON NFHS-5 DATA Barnali Saikia, Leena Bhagawati, Partha Alok Das	59-67
10	CHANDUBI LAKE : DESCRIPTION, COMPARISONS IN PRESENT TIME AND ITS IMPACT ON ENVIRONMENT Jitu Rajbangshi	68-78
11	A GIS BASE STUDY ON GROUNDWATER ARSENIC CONTAMINATION IN RANGIA CIRCLE OF ASSAM, INDIA Dr. Dhrubajyoti Rajbangshi, Tirthankar Sarma	79-83
12	DIGITAL MEDIA MARKETING : AN INCREDIBLE TOOL Manisha Buragohain	84-91

CHANDUBI LAKE : DESCRIPTION ,COMPARISONS IN PRESENT TIME AND ITS IMPACT ON ENVIRONMENT

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ABSTRACT:

Chandubi is one of the beautiful Natural Lake and a wet land of Palashbari Revenue Circle of kamrup district of Assam, rich in bio-diversity and a natural site untouched by environmental pollution, isolated from human hue and cry and also from the giant Man-Made structures. It's a very calm place (Wetland) having Peace of mind. The lake is surrounded by hills all its round with green forest around, home of dominating Rabha community of Assam and situated near the border of Assam and Meghalaya. Its geographical Location, Drainage, Origin, Present status, Its future, Local People around and their sincerity for the wetland etc. to be discussed. A solitary site for recreation and Eco-Friendly environment forever for the human beings. A study was carried out here from 2010 and again put attention here in 2015 to 2020 to compare any changes in the Lake and Wetland environment and its impact in human life. The objectives of the study is to recognize it as a rich environment of multiple Eco-Systems , Awareness , Preservation for future, A means to provide Livelihood to its people and to promote its richness.

Key word: Beel, loop, impact, Rabha Hasong

Chandubi is a natural fresh water lagoon a wet land and also called Chandubi Beel locally with a calm solitary environment with surrounding hills of Assam and Meghalaya ,a site rich in bio-diversity, home of varieties of local and migratory birds , located towards the southernmost part of kamrup district of Assam at a distance of 62 K.M. from guwahati city ,45 K.M. from Lokopriya Gopinath Bardaloi International Airport , Guwahati Chandubi lake and its vast surrounding is under the local administration of Rabha Hasong Autonomous council territory. To reach Chandubi from Guwahati drive on national high way 37 from guwahati to Mirza , turn left at Mirza police point on the way of Palashbari Rajapara Chandubi Road , a P.W.D. black topped single road towards the southernmost part of kamrup district via barihat- loharghat- bagan-muduki-rajapara-chandubi.

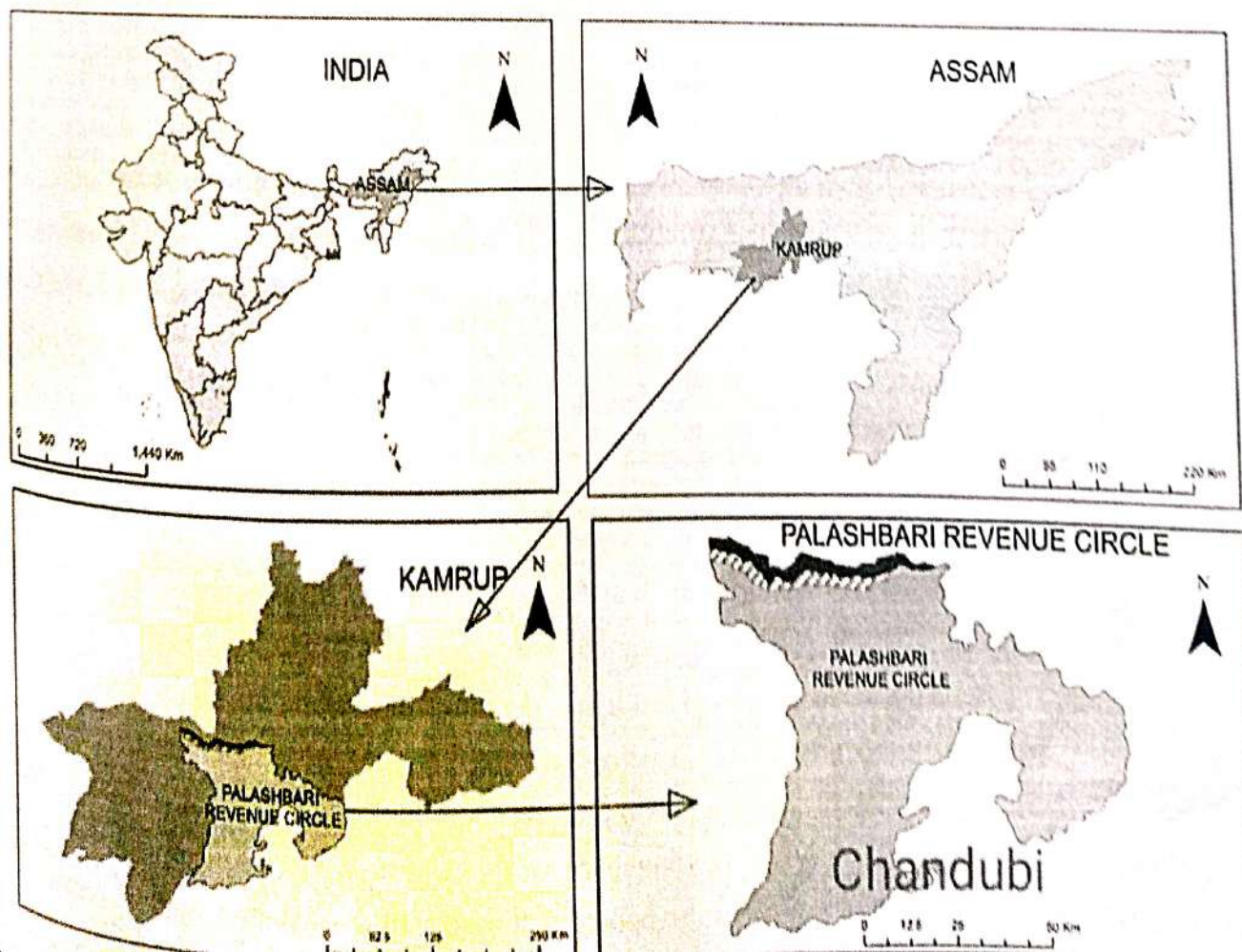
Chandubi is a natural lake as well as a wetland. It was originated tectonically by the earthquake of 1897 (8.7 Magnitude) in ASSAM, the lake area was subsided by this massive earthquake to form a lake environment. According to Wikipedia-A wetland is a distinct ecosystem that is inundated by water, either permanently or seasonally, where oxygen-free processes prevail. The primary factor that distinguishes wetlands from other land forms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique hydric soil. " Ramsar convention on Wetlands define wetlands as : " areas of marsh , fen , peat land or water , whether natural or artificial , permanent or temporary , with water that is static or flowing , fresh , brackish or salt . including areas of marine water the depth of which at low tide does not exceed six meters " . "

The name of chandubi had connection with CHANDA SADAGAR (Local landlord and merchant) of Champak Nagar (greater chaigaon of kamrup) who anchored his ships here to trade with hilly people (Meghalaya). Dubi Means -Deep Water bodies. So Chanda+Dubi combined to Chandubi There is a Ancient folk tell of Chand Sadagar of Champak Nagar .If Chand Sadagar proverbs is accepted ,it was found that in ancient period Chandubi region must have some already existed lake like form of water reservoirs in between the

hillocks and those lakes must be linked with Kulshi river. Second proverb-the name chandubi aroused from the Khasi Tribe Who called it the "God of five Lakes "- "The Sun Ublei Dubi" those day the present lake area had some deep water logging areas look like lakes here and there. Again during the British rule British came here to enjoy the beautiful sun set here and amazed with the sun set view -Sun + Dubi (dubi means submerge in local name). The wetland of chandubi was a composition of four lakes namely Chandubi, Ranakhunda, Memerimari, Popasom. The three vanished due to mass sedimentation from the foothill of Meghalaya and Assam. The hillock to the north and the low lying area to the south that has some narrow streams flowing down, all have subsided in the earthquake of 1897, Subsided hillocks turn into deep water lake by the accumulation of water of numerous streams. These streams flowing down blocked by the sudden change of ground level due to massive earthquake. The hillock was covered with dense forest then. Local people put evidence that there are existence of tree trunks of that dense forest till today which were subsided. If anybody suddenly fall down in the water of the lake he or she never return alive or rarely return alive. Every year during picnic period people accidentally lose their life here due to drowning.

The location of the lake lies in between $91^{\circ}22'E$. Longitude to $91^{\circ}30'E$. Longitude and $25^{\circ}48'N$. latitude to $25^{\circ}52'N$. Latitude. The wetland occupies an area of 4.5 K.M.^2 and under the control of Barduar -Myong protected forest reserves and kulshi river catchment area. There is a linkage with kulshi river and Chandubi by a narrow channel called lokiajan. The flow direction of lokiajan can be explained with the meeting places like- Chandubi-Kumnighat-Kathalguri-Chaparakata -meet kulshi river in between Bherbheri and Katrabari . Water level of Lokiajan slide down in dry season looks like a dry upped river but still it maintain underground water flows in between Chandubi and Kulshi River.

Chandubi Wetland



Centre data, Chandubi has an area of 481.19 hectares in 1954 , 392.62 hectares in 1967 , 203.20 hectares in 1997 and 186.52 hectares in 2007. If the British India's Chandubi (1900) and post Independent India's (1954) During the British period around 1900 to 1915 chandubi lake water body (Wetland area) covered an area of 1040 hectares which reduced to 180 hectares in 2010. Again according to Assam Remote Sensing Application Chandubi compare it shows that 54% wetland area was vanished around 50 years ago. It is quite clear that the wet land area is shrinking at a very fast rate and within present 50 years the lake area reduced 60% . During summer rain huge mass of sediment formed by soil erosion and debris of landslides and those transport to depositing in the wet land area, as a result its bed had big rising, and encouraged the shrinkage of lake area. The local inhabitants quite prominently observed the area of the lake that is getting close to closer year after year by this process of sedimentation.

It is a fresh water lake cum wet land rich in bio- diversity and home of birds (An Area of different species of birds – A1 Category)

Though the lake area is rich in bio-diversity but its richness is degrading with time. Once dominant biotic species now rarely found, not found or absent. So appropriate measures are necessary to take utmost care for preserving Lake and its fringe area. The wet land area, is under the control of forest department government of Assam. The lake and its biotic life seems to be not safe here rather threatened by different elements likely Shrinking , downing water level , Deforestation , Excessive spreading of weeds and grasses , Picnic and lack of scientific research for conservation .

A developmental scheme of Chandubi Beel (MNREGA) was inaugurated on October , 2014 under Chayani Barduar Development Block, Jharobari, Kamrup with the sole objective of cleaning the lake (Reclamation) but the scheme had been withdrawn with the intervention of DFO Kamrup west . He remarked, "The way of block has undertaken the work in the name of cleaning is not acceptable. According to the wetlands (conservation and management) Act 2010 , there is a restriction in the reclamation of wet lands " . According to wetland experts "the aquatic eco system of a water body might be disturbed if activities, including cleaning, are carried out without consultation of expert". (Talukdar Kishore October 25, 2014.) "Expert opinion is a pre requisite before initiating development activity and special care is imperative before the wetlands reclamation to keep its natural eco system", M.M Goswami, Gauhati University.

OBSERVATIONAL SURVEY AROUND CHANDUBI (2010-2020):

It has been personally observing the wetland since 2010 and what was observed , may be highlighted. Water level decreased even in the rainy season compare to earlier days. 250 cm or more rainfall takes place here during summer (Apr.-Sept.). It is like a water reservoir of summer rainfall, but never occur severe flood here. On the other hand in the winter season it was found a considerable amount of water had been stored here (But lesser amount than summer). The matter was discussed with local peoples regarding this and they are also agreed with . A youth of Rajapara village, Sankar Rabha reported that the Kulshi river which has a link with Chandubi through the narrow channel Lokiajan , the inundating water of chandubi tends to flow subsequently to kulshi river and the kulshi River flowing north meet the Brahmaputra River in its south bank. The Kulshi River Bed had gone deep to deeper now due to overexploitation through sand picking activities and has got more and more capacity of water holding in the kulshi river Basin. Kulshi river is also famous for the endangered and rare species River Dolphin . So pollution of water here in Chandubi , adverse impact may

takes place in the river Dolphin of kulshi river. Again Over exploitation of Kulshi River sand minning that is destroying aquatic life might adversely impact on bio diversity of chandubi.

The weeds, tall and thick grasses and other aquatic plants that were seen earlier also, now covered the lake in a more widespread way. Only the narrow patches of water free from aquatic plants are visible in the lake. Local boatmen follow these patches for boating in the lake. Mainly two types of vegetation are covering the lake like a sheet, one that is tall grasses, shrubs, climbers and small water born trees etc.grows luxuriantly with deep rooted characters and the other one is floating vegetation. First one is growing from its bank to the shallow water areas and the second one is moved with the wind direction and these floating vegetation quite unique as these are looked permanent tall grasses , anybody can't recognize unless long time observation. Chandubi wetland vegetation cover is germinating very fast occupying more areas than the earlier time and if not controlled, there will be hardly little open water space in the lake. A change of developmental works are noticed like electric line, proposed walking track near the bank of the lake, proposed watching tower to enjoy lake view, proposed drinking water facilities (tube well, well and supply of pure drinking water) , toilets etc. to be expected to complete very soon in 2015 and all these work had been already completed in 2017-2018.

A radical change of forest cover in and around the lake may be notice. Compare to 2010, the nos. of valuable big and tall trees like Teak, Sal, Gomary, Titachap, Bonsom, Khakhan etc. are considerably decreasing in 2015. The impact of deforestation affect the lake environment. Another impact of deforestation around the agricultural fields of the wetland is the Man and elephant conflict. It becomes a serious issue of the region. As a temporary preventive measure people made many Tongis on the branches of trees adjacent to the agricultural field where people keep vigilance at night during the pre-harvesting period of paddy cultivation.

There was a typical land locked forest village to the west bank of Chandubi lake Called Joramkhuria. Most of the villagers occupied primitive agriculture here till 2020. But now a gradual changing is noticed. Guardians are more aware of child education. In 2015, Only one Anganwady centre was there in the village. Children daily moved for education at different level crossing the lake by boat. There was no CHC in the village. People were being untouched by government facilities like house, toilet, pure drinking water supply, loan, agricultural seeds and electricity etc. But In 2018 electricity connection was reached the village. A few eco-tourism centers also emerging here by the local youth where people getting livelihood. Now every family has own a boat for their lifeline. The lives of the people were very hard here at Joramkhuria village. During picnic period only outsiders used to come here as a visitors to experience the typical village, but from 2021 the people of Joramkhuria village of Chandubi are no more land locked now with the construction of new pucca road from Barduar Bagan. This new road start from Barduar Bagan Bazar, crossing right the Batha river ,Khokhapara ,Laduguri, Rangamati, Khopdia, Japangbari and Joramkhuria village, it's a 17 KM long road passes through the Forst reserves, green natural landscape, agricultural fields and the ethnic villages of Rabha Communities, an observable change around the region that's an anthropogenic change may be expected in near future and it's an impact of Chandubi. Now from 2018 onwards Joramkhuria become an Eco-Tourism Centre of Chandubi where tourist can have local guide, lodging ,boating, trekking, spare time with nature ,ethnic food etc.. And the local people are also getting new source of income. (out of the total youth at present 25 % of youth engaged here other than primary activities.) The villagers of Joramkhuria is an integral part of Chandubi lake and it seems that they are very sincerely getting conscious of the lake.

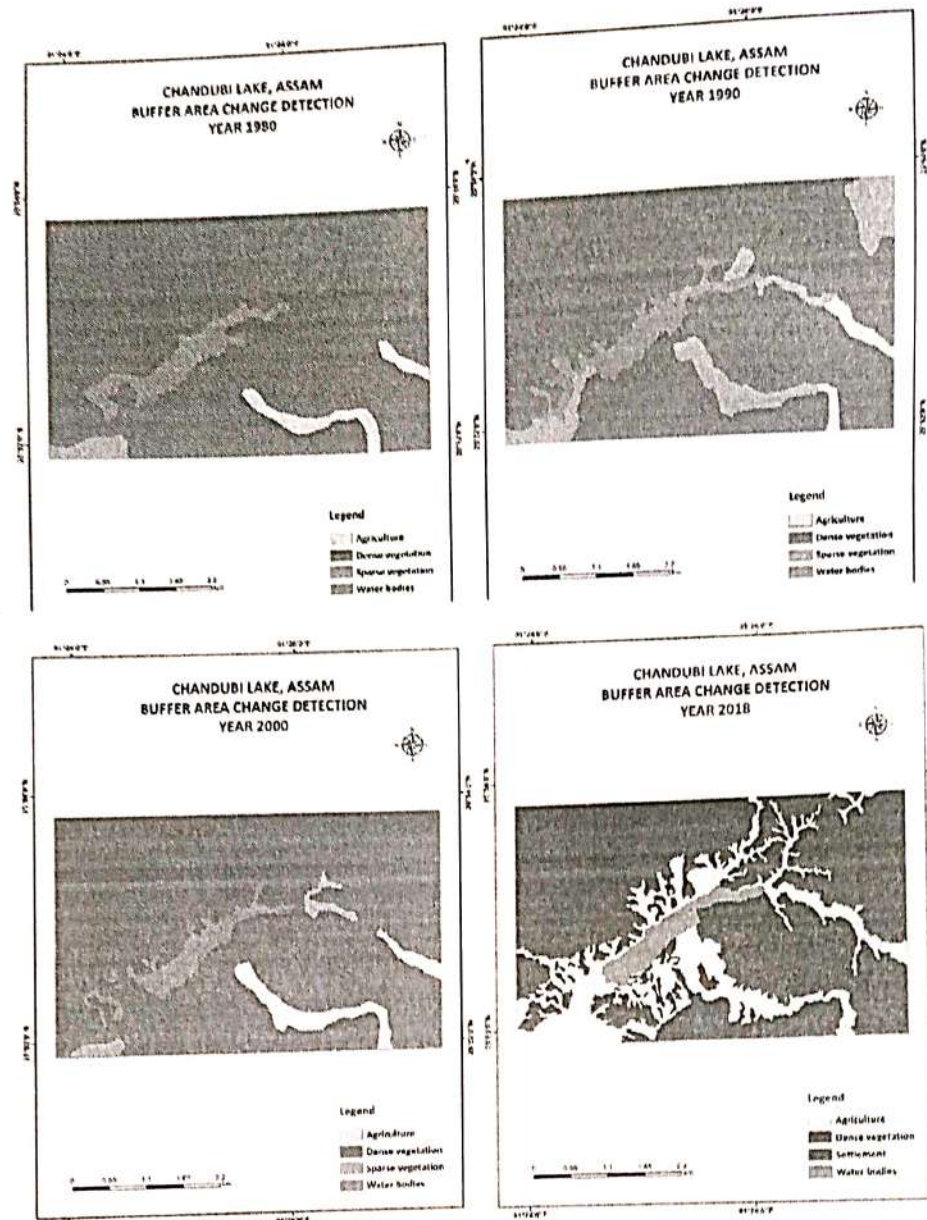


Figure 1: Buffer area change detection maps of Chandubi lake, Assam (1980-2018)

Table 1: Change Detection of Chandubi Lake, Assam

Year	Water Bodies (K.M ²)	Dense Vegetation(K.M ²)	Sparse Vegetation(K.M ²)	Agriculture(K.M ²)	Settlement(K.M ²)
1980	2.116938	18.655153	0.3321	0.6219	NA
1990	1.233874	17.162911	1.992191	0.337116	NA
2000	0.933043	18.652834	0.323861	0.816285	NA
2018	0.885779	15.511362	NA	4.375647	0.063305

Source: Satellite imagery Data

In the table it was shown that the Chandubi wetland is shrinking with its water bodies, agriculture field area is increasing, and dense vegetation cover is decreasing. Chandubi Lake was the hotspot of valuable Sal, Teak and other big trees but from 1980 to 2018 about 798 acres of forest cover had been deforested. Further this deforestation mainly occurred within 2000 to 2018, because prior to 2000 and further back up to 1980 (1980-2000) there were almost uniform area of dense vegetation cover was existed. Decreasing of forest cover

around Chandubi encouraging the soil erosion and sedimentation at Chandubi and finally helps in shrinking. Another major negative impact of deforestation is man and animal conflict. Every year local farmers around Chandubi suffer with damage of paddy cultivation by assemble of Elephants those often destroy the paddy cultivation. Elephant often come down from hilly terrain to the low land near chandubi especially at night time in search of food. Herd of Elephant also damage houses, banana cultivation, vegetable fields and local forest. Local people construct tong or tongi on the big trees near the paddy fields to send back the multiple groups of Elephant to protect their agricultural produce . People also use traditional sharp tools, crackers to intimidate the Elephants. Besides elephant another animal responsible for damage of crop around the Villages of Chandubi is congregation of monkies, those damage the corps and vegetables at the Budding stage onwards. This issue is further more acute around barduar bagan, muduki, Khokhapara, japangbari. Once this was the area used to supply organic seasonal vegetables, fruits, Battle nut to Mirza, Bijaynagar, Palashbari, Guwahati and others places but today people are not ready to practice this kinds of crops and vegetables. So man and animal conflict is a major issue here around Chandubi that is still unsolved here. But the main root cause of Man and Animal conflict around Chandubi is Deforestation and who deforested none other than local people only. As per table in 1980 around Chandubi fringe area, only 64 hectares (0.621KM²) of agricultural land area was there, in 2000 that was increased to 83 hectares (0.81KM²) and in 2018 it was increased abruptly up to 451 hectares (4.3756KM²). It has clarified that farmers might have cleared the forest cover into agricultural fields for the practice of agriculture around Chandubi.

Within observation , it was found that the ray of hope arising day by day to preserve chandubi through the effort of some positive groups, but still lots of work yet to be done. now loharghat forest range office with the local committee prohibiting the use of plastics, loud sound of music, drinking alcohol, entering forest without local guide, use of equipment, gadget that harm natural environment etc. which one has to be followed. Bio-Diversity shrinking at Chandubi .

Fauna	Names	1980	2000
Birds	Grey Headed Fishing	Dominant	Not seen
	Eagle	Present	Absent
	Greater Horn Bill	Present	Absent
	Snack Bird	Present	Absent
	Lesser Horn Bill	Present	Absent
Mammals	Otter, Leopard Cat, Black	Present	Rare
	Bear, Wild Boar.		
	Barking Deer.	Dominant	Not Found
	Sambar	Present	Not Found
Reptiles	Golden Tree Gecko	Present	Not Found
	Varanus	Present	Rare
	Gecko gecko	Dominant	Rarely found
	Turtle Species	Present	No Data

Source: Lokia 2012-2013

Chandubi was a Bio-Diversity hot spot region till 1970 that was shrieked gradually after that. It was a store house of indigenous fishes .Upto 1950-1960 community fishing was held here during the Months of December to March every year. Local people performed fishing here from Urput, Kumeria, Sikarhati, Amranga and they caught fishes here and people observed the huge numbers of dead fishes on the wetland water in the very next day of fishing as the water condition became unsustainable muddy state . for fishes may be considered as one of cause of fish decreasing at Chandubi. Around 1980 Fishing was banned here by order of Assam forest Department.

Following are the Causes behind the shrinking of Biodiversity of Chandubi wetland Region.

1. Deforestation and Soil Erosion
2. Construction of road and communication.
3. Settlements.
4. Seasonal Dryness of Water level of Kulshi River.
6. Disturbance by Human interference during Picnic and Chandubi Festival.



Figure 2: Satellite imagery of Chandubi Lake and Kulshi River, Kamrup, Assam

SUMMARY AND CONCLUSION:

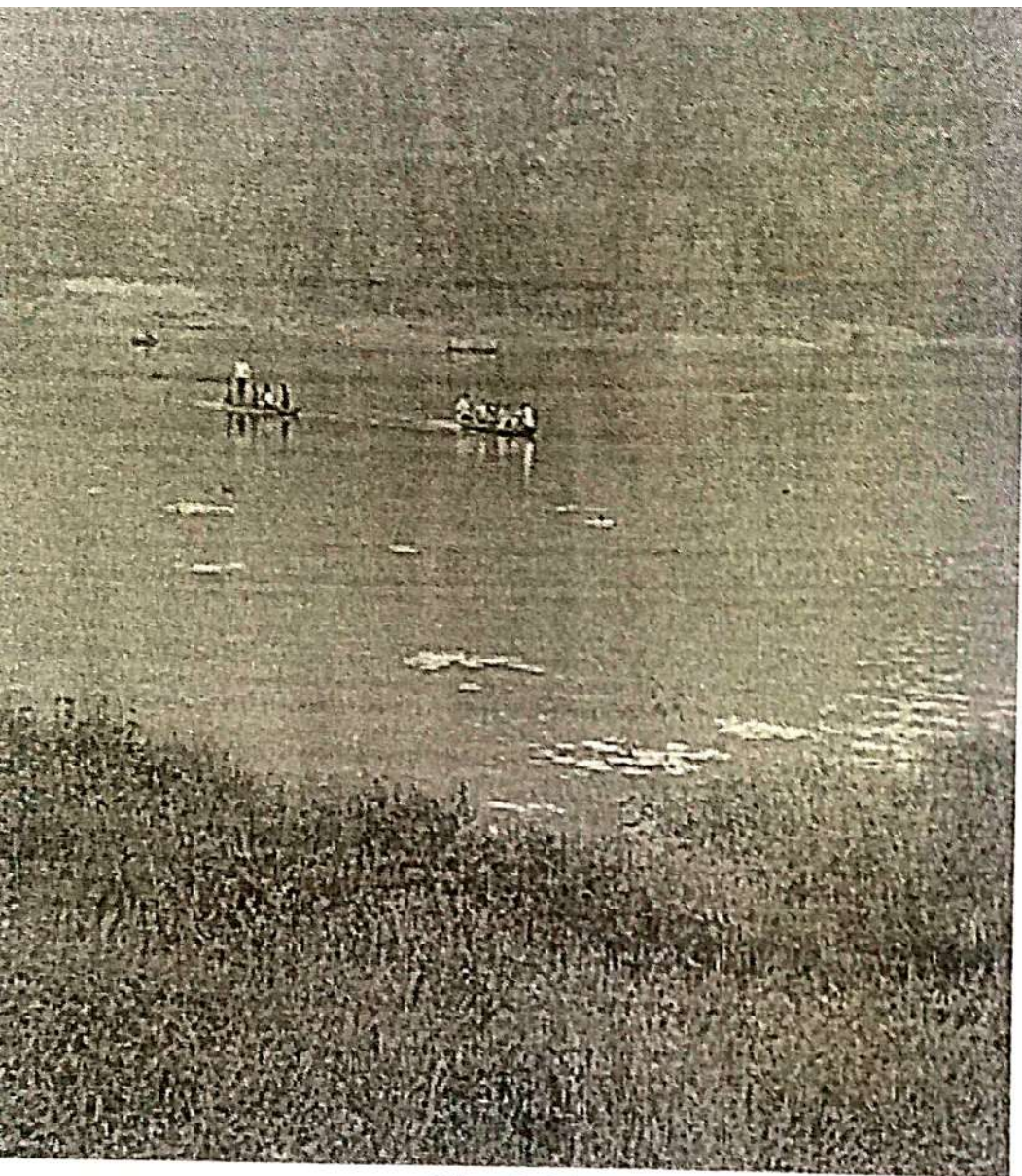
Proper road system from mirza, good road connectivity with Meghalaya State to chandubi, continuing chandubi festival for promotion of chandubi's name, proper food availability, fuel, drinking water, lodges, Public toilets, medical facility, mobile network, boating, fishing, tracking, park etc amenities be provided with prior expert suggestions.

With the celebration of Chandubi Festival at the bank of Chandubi lake from 2010 onwards, and the publicity of festival attracted many people towards it. The old narrow PWD road from Palashbari to Chandubi via Mirza has been upgrading to ten (10) meter lack topped wider permanent roadhaving with both side footpath with the allocation of Rupees 157 crores under Assam Mala is near to completion in 2022happening due to increasing the attraction and importance of Chandubi.

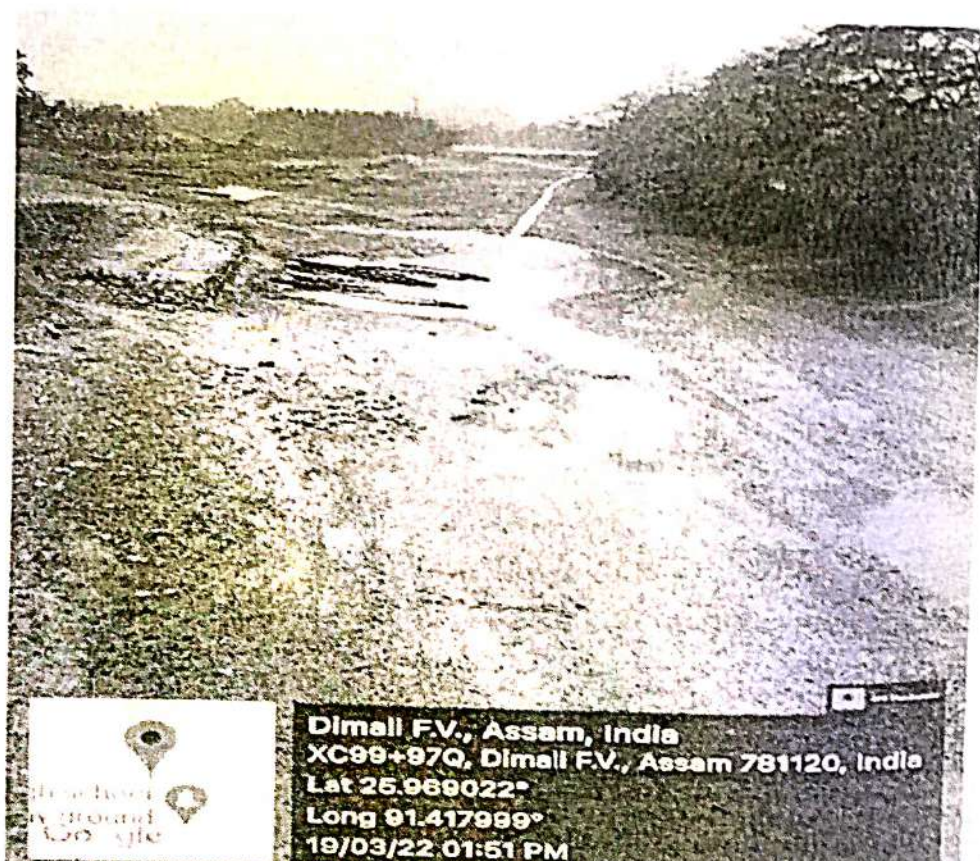


Tong or Tongi of Chandubi





Chandubi





Aquatic floating Grassland of Chandubi

The water feeding river of Chandubi Lake is the Kulshi River which source is located in the Meghalaya plateau, it means it is not perennial, the water level of kulshi river vary with seasons and at present the river bed is getting dry in the month of march 2022 at kulshi market Bridge point which is very alarming for Chandubi and Kulshi basin. Lokia the only stream that has linked Chandubi Lake with Kulshi, its water flow may not be visible during dry seasons often covered with mass of sand dunes may be treated with digging out a permanent canal with Chandubi and Kulshi River.

Extensive plantation drive is necessary for the cause of Chandubi, discharge excessivesediments along the loops and bed to control shrinking of Chandubi with the consultation of environmental expert. Control loud sound, maintaining distance of parking vehicle and avoid Picnic at the bank of the Lake. Total banned of use of plastic in the Lake region.

Chandubi's importance should not be defined on single criteria. It is a site rich in bio diversity, nodoubt, but also a site of recreation, eco-tourism, and center of research and center of forest resource. A proper coordination with Assam forest department, Assam tourism development corporation, RHAC, CDB, local NGOs, local Panchayat, local imminent persons and the Executing Expert Committees views and their involvement to save Chandubi is solicited. A proper management system is necessary. Release of excessive sediment from its bed and to clear excessive grasses on the lake, safe boating Facility etc. are necessary with the guidelines of Expert committee. Carrying capacity norms should be followed during peak period of picnic and Chandubi Festival. An involvement of the honorable chief Minister of Assam is important for the development of Chandubi. A master plan is necessary following strict rule and regulation fixed by the expert committee in executing its conservation, preservation and developmental Master plan work. Till today whatever

initiative was launched for its preservation project it hampered in the name of expert views, Why not experts suggest models themselves for its preservation, conservation, promotion? In this regard administrative power be handed over to the Expert committee so that they could make proper decisions and make them free from political intervene. Chandubi is a fresh water lake, a wetland, an un-declared bird's sanctuary, a center of research, an economic resource and at the top the heritage of Assam.' From its origin in 1897, today hardly 20% wetland's area remained. Let have a good start to save Chandubi for the future humanity.

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