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Dear Readers,

We are happy to present the second issue of year two. One of the great threats that the biota of this region is facing the threats of anthropogenic activities like the initiation of new large and medium dam projects in the region along with the displacement issue. With the identification of total of 168 dam projects totaling 50,000 MW inventiveness after the banning upper and middle Subansiri dams by Honorable Supreme Court in 2004 has catch the attention of general public of the region.

Hydropower potentiality and economic growth and development have become one of the most squabble topics with respect to the north-eastern region of late. With potentiality of 1,50,000 MW of the nation, the Indian Himalayan region alone is capable of producing 70-80% of it, ranking Indian power sector at third largest Dam builder after China and USA. The tributaries and sub-tributaries of mighty Brahmaputara along with the major rivers like Subansiri, Kameng, Siang, Dikrong, Dehing etc. have the huge potential in terms of hydropower generation. Given the fact that this region is known for its massive biodiversity potential with more highest mammalian and avifaunal diversity in India (with more than 250 mammalian and 900 avifaunal species), 5000 species of plants (among them 800 flowering plant species are listed as endangered in Indian Red data book). With two Endemic Bird areas and covering a major chunk of the Eastern Himalayan Biodiversity hotspot, the region encompasses many endemic species restricted to few square kilometers. With the coming up of these huge numbers of large and medium size dams, the heat of the major ecological and environmental disaster of the cumulative effect of upstream and downstream impacts.

Dam also acts as a barrier between the upstream and downstream movement of migratory river

animals, primarily the hill stream fishes where upstream act as some of the potential habitat for breeding and upstream act as huge gene pool for those high altitude hill stream fishes. With the change in the river ecology will also affect the huge grassland ecosystem that exists on both side of the mighty Brahmaputra as these floodplains depend on the seasonal flooding from the upstream rivers. The farming activities in the state of Assam and most part of Bangladesh are characterized by traditional flood recession cropping pattern and the land is cultivated taking advantage of the residual soil moisture after floods recede. Although Dams alleviate flood that turn out devastation in few localities of downstream but it will affect the ecology and agriculture seriously which perhaps will be more devastating than the yearly flood.

Last month, one of the prominent environmental magazine covers the story of the impacts which are already seen in many parts of the western Himalayan region particularly in the state of Himachal Pradesh with construction of dam on river Sutlej has upsetting the yields of apple and chilgoza two of the major cash crops of the Kinnaur District, even the horticulture Department of Himachal State Govt. also agrees on that. Displacement issue is another hitch part of the large and medium size dams. Perhaps the displacement issue has been in focus in India since the construction of major hydropower installation that started way back in 1902 at Sivasamudram before independence. According to the World Commission on Dam Report, 2000, there are 160-320 new dams are constructed each year and at present there are 45,000 large dams in 140 countries in the world. Along with them the issue of displacement also came. The displacement issue of some of the minor tribes or sub-tribes will be one of the biggest issues in recent future if all the assigned dams of Arunachal Pradesh are over. Probably the sub-

tribes, their ecological knowledge systems and cultural practices related with biodiversity along with customary practices that exist within very restricted range of their traditional occupancy in the highest biodiversity rich state of the country. Probably the huge displacement will lead to lost of the entire knowledge system among these ecosystem people. Probably we need a new look into the dam issue with more ecological and cultural prospective of both upstream hill tribe and downstream tribes of Assam flood plain.



Kripaljyoti Mazumdar
Editor-in-chief, Ecotone



Cover Page

Butterflies of Ultapani, Kokrajhar District, Assam
Photographed by Kushal Choudhury

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LETTER TO EDITOR

Solid Waste Management in Guwahati City

Sir,

Wastes have created one of the most serious environmental hazards today and also detrimental effects on human health. Solid waste is the organic and inorganic waste material produced by household, commercial, institutional and industrial activities that have no value generally. Major categories of waste are as follows:

- i) Municipal Waste
- ii) Industrial Waste
- iii) Agricultural Waste
- iv) Energy Waste and
- v) Sewage Waste

Absence of adequate waste disposal system is a perpetual environmental hazard in cities and towns. Growing industrialization and ever increasing population, increases the production of paper, leather, metals, plastic over a few decades. This resulted in steep increasing in the generation of solid waste around the world. It is seen that in the Guwahati city the heaps of rubbish is lying here and there. This increases environmental pollution also contaminating water sources. The unscientific open dumping of municipal solid waste increases the contamination risk, causes diseases due to pathogens and fly.

According to Guwahati Municipal Corporation (GMC) sources, the city of Guwahati generates about 500 metric tons of solid waste every day. All the dumping sites except Bargaon has been banned to minimize the environmental pollution. The dumping contract in the Bargaon area (waste generated in whole Guwahati city) was taken by Ramki Environmental Group of Company under the Guwahati Waste Management Project. According to them about 400 metric tons of solid wastes are generated in the Guwahati city. Of them 350-360 metric tons of wastes are dumped

daily. About 370 dustbins are allotted in different parts of the city, 25 twin bin dumper vehicles, 50 autotripper and 200autocycles are allotted for carrying the wastes to the dumping site. About 3000kg or 3 tones of wastes are carried by one truck in one time and one truck makes 4 trips per day to collect all the solid waste of the Guwahati city.

Some microbiological methods have been developed to treat the organic part of these municipal solid wastes by use of microbial biodegradation such as sanitary landfills, composting, etc. Microbiological studies on organic solid waste convey multi-dimensional significance. A large number of aspects can be associated with the organic solid waste when observed from the different angles of environmentalists. Biological treatment is one of the largest and most important controlled applications of micro-organisms in degradation of solid waste. Micro-organisms, especially bacteria and fungus are capable of biodegrading organic compounds under prevailing environmental conditions.

With increasing population and growing civilization a steep increase in organic solid waste generation have created a catastrophic in cities and towns. The huge amount of organic waste accompanied with uncontrolled and unscientific dumping has posed a serious threat to the environment and eco-friendly atmosphere in several parts of Guwahati city.

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GREEN NEWS

Assam Forest staff to get firearms

Guwahati: Assam has probably become the first state in the country to arm its forest personnel with various kind of sophisticated weapons to tackle the growing menace of poaching, which primarily targets rhinos and tigers.

A notification issued by Assam a couple of weeks ago, provides immunity to all ranks of forest staff from prosecution without prior sanction for using firearms and killing poachers both inside and outside national parks, wildlife sanctuaries and reserved forests.

"So long there was no legal or administration provision for our staff engaged in protection of wildlife and reserved forests to use firearms of any kind. Whatever weapons they have been using so long was just because of the goodwill of the administration. Otherwise, generally speaking they were all liable to be arrested and prosecuted for using firearms while discharging their duties," VK Bishnoi, principal chief conservator of forests (PCCF), Assam said Monday.

PCCF Bishnoi said Chief Minister Tarun Gogoi readily agreed to such a decision when the proposal was put before him.

(Source: www.in.news.yahoo.com)

“Degradation of Himalayan eco-system an issue of concern and a challenge”

Gangtok : Dr Prodipto Ghosh, former Secretary of Ministry of Forest and Environment, Govt. of India said Sikkim should play a ‘vocal role’ in the issue of degradation of Himalayan eco-system.

Dr. Ghosh was addressing the third Foundation day National Seminar on ‘Mountain Regions and Climate Change: Impact, Adaptations and Policies, here at Chintan Bhawan on August 7, organized by Sikkim University. Former chief secretary of Sikkim Mr. KC Pradhan chaired the first half of the seminar.

Delivering his key note address on the seminar topic, ‘Challenges for sustainability in the Indian Himalayas’, Dr Ghosh, who is also the India’s representative in the global climate change negotiations, said the climate change refers to the ‘change of the climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere’.

Mentioning that the Himalayan bio-diversity hotspot covers an area of nearly 7.5 lakh square kilometer he said, it also produces a distinct climate of its own. He said, the Indian Himalayan region consists of 816 varieties of trees, 765 wild edibles and over 1,740 species of medicinal plants which are of great significance and value.

Stating that the degradation of Himalayan ecosystem is emerging as one of the major issues of challenge and concern for the environmentalists, Dr Ghosh pointed out that deforestation, submergence of rivers and valleys by hydro power plants, pollution of fresh water sources, improper sewage disposal are some of the major factors which are affecting the Himalayan eco-system directly.

All three major policy documents on Himalayan study are premised on accomplishing sustainable development and not environment conservation or responding to climate change, he added.

(Source: <http://himalnews.wordpress.com>)

PURSuing A SUICIDAL SPOT OF BUTTERFLY

Kushal Choudhury



North East India comprises of eight small states connected with the rest of India through a narrow corridor, except Sikkim. Assam is situated at the centre of Meghalaya, Manipur, Tripura, Arunachal Pradesh, Mizoram and Nagaland which is popularly known as seven sisters. It covers an area of 78,438 km². Assam is the amalgamation of plain and river valley. The climate of Assam is sub-tropical monsoon type and its temperature ranges from a maximum of 29°C to a minimum of 16°C. It is said that the land of Assam receives the maximum amount of rainfall in the entire world that goes from 70 inches to even 120 inches. Topographically Assam is characterized by a wide array of mountainous terrains, plain lands and wet lands. The tributaries of the Brahmaputra and

Barak not only add beauty but also maintain a hydrological cycle to the landscape. Its principal geographical regions are: the Brahmaputra Valley in the north; the Barak Plain in the south; and the Mikir and Cachar Hills that divide the two regions. Due to these diverse climatic as well as physiographic conditions this region is very rich in both flora and fauna.

Butterflies are fascinating creatures and have a special place in the insect world. They are distributed in almost all parts of the world from the tropical to the polar region but diversity is more in the tropical region. Among the insects butterflies are well studied group belonging to the order Lepidoptera. The word Lepidoptera means - presence of scales on their wings which give various coloured patterns to these insects when reflected. Their immense diversity, size, shape, colours and

adaptability to virtually any climate has made them some of the most successful creatures on earth inhabiting warmer tropical rain forests, semi evergreen forests, moist and dry deciduous forests, swamps, scrub forests, open plains and grasslands.

Butterfly watching was first started by the European peoples as a symbol of aristocracy during the period of Queen Elizabeth II. During the period of British Raj they had also started watching butterflies in different parts of India. But the first systematic work on the Indian butterflies was worked out by a British engineer Colonel W. H. Evans and wrote the book 'The Identification of Indian Butterflies' in 1927. In the year 1932 the book revised and published its second edition where he clearly depicted many North Eastern butterflies with their taxonomic keys. After that many people re-explored the butterflies of North East India like G. Talbot, M. S. Mani, R. K. Varshney and B. Nandi time to time.



Yellow Crested Spangle Papilio elephenor rediscovered by Author in India after early 1900's (Photo: K. Choudhury)

There are about 180,000 species of butterflies recorded all over the world of which 1501 species are recorded from India. Evans (1932) reported pres-

ence of 962 species belonging to the six families from North East India but its present status is not clear. Though very few workers are working in this field in their local areas but extensive works are still wanting. Presently it has been observed that people are coming forward to conserve these jewels of nature in community level and they have started developing ecotourism taking butterflies as a tool. In this regard perhaps for the first time Department of Forest and Tourism of Bodoland Territorial Areas District (BTAD), a newly created Autonomous Council of Assam has taken immense initiative to explore their butterfly wealth in Ultapani Range under Haltugaon Forest Division. This area is a harbour of more than 300 species of butterflies. One can enjoy thousands of butterflies on any sunny day on an average range up to 30 km forest road passing through the Ultapani Forest Range. This makes the average density up to 80 / km² which are significantly as high as compared to other butterfly rich areas. It has been observed that thousands of different varieties of butterflies congregated on the road for mineral sucking which look like a carpet of butterflies on the road. Usually this activity is shown by the male butterflies to acquire minerals to gift their female during copulation which is called mud-puddling. Virtually all butterflies are associated with plants and therefore their occurrences directly depend on the presence of availability of larval as well as adult food plants.

But it is very deploring that since the gravel road is the only means of transportation to some forest villages and also to Bhutan through this reserve forest, hundreds of innocent butterflies died for that vehicular movement. Therefore vehicle traffic on this road has posed a serious threat to these butterflies. It has been observed that road mortality may not affect abundant population but it can have a significant impact on populations of threatened and endangered species of butterflies. Since this area is the harbour of the rare butterflies like Yellow Crested Spangle, Perak Lascer,

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Moore's Cupid and many more, it is of utmost importance to conserve them and stop their unnatural death.

To minimize the road-kill of butterflies, certain experimental artificial mud-puddling sites were developed near by the road side to distract the population from the road with the financial assistance of Bodoland Forest Department in the year 2006-2008. The mud-puddling sites were maintained by providing cattle urine, occasional road killed carcasses, fruits and faecal matters. It was recorded that a good number of butterflies belonging to the family Nymphalidae, Peiridae and Papilionidae were attracted towards the artificial mud-puddling sites. Biodiversity Conservation a local NGO, Aaranyak and Forest Protection Force (FPF) a voluntary organization are strongly involved for the conservation of butterflies as well as development of tourism in this region.

Road kill due to vehicular traffic and the choice of road as mud-puddling site by butterflies is inevitable in Ultapani Range. The road is a boon as it provides an excellent site for butterfly watching and therefore has immense potential to become an eco-tourism spot but at the same time it is a bane as it like a 'suicide point' for several butterflies. Since the prime factor for butterfly swarming is mud-puddling, so alternatives such as artificial mud-puddling sites can be designed to prevent any severe mortality. Further, a long term research and conservation strategy needs to be initiated to study this butterfly paradise.



Striped ringlet (Ragadia crisilda) at Ultapani, Kokrajhar (Photo: K. Choudhury)

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FOCAL POINT

A NEED FOR CONSERVATION OF BRYOPHYTES IN NORTH-EAST INDIA

H. Govindaparyi, Divya Dandotiya, D.P. Semwal and P.L.Uniyal

Bryophytes are a diverse and distinct group of primitive plants with about 25,000 species. Their individual grow closely packed together in the form of mats and cushions on soil, rocks, dark caves, tree trunks, branches and leaves, and in all terrestrial biomes and appears to be an Ecological keystone group. They are the group of plants that ventured first on the barren land during the origin and evolution of land plant. Bryophytes constitute a distinctive component of forest ecosystem. They are popularly known as pioneers of succession, which occupy barren land and make it habitable. They play an important role in ecosystem dynamics, nutrients cycling, soil formation, providing microhabitat for other plants and animals, promote seed germination and fill gaps in the habitats. In the recent years bryophytes have been widely used for pollution monitoring and bioremediation. They have been proved as suitable model system.

Distribution

India with its varied climatic and topographic conditions in different parts provides congenial environment for the luxurious growth of the bryophytic vegetation. The richest assemblage of mosses is found in the eastern Himalaya. Some bryophytes tend to grow in a variety of specialized habitats. Distribution of species community and vegetation of an area are subjected to modification by the environmental, geological and biotic factors.

Due to rapid urbanization and pressures inflicted by the inevitable growth of human population and

other anthropogenic activities, the gene pool inherent in the Himalayan belt is being lost at an alarming rate. The insurgency on other Indian hill spots has resulted into many fold increase in mobile population, thereby intensifying the depletion of bryo-wealth. From an ethical point of view each species has an intrinsic value which cannot be overlooked. Conservation of bryophytes is important as their ecological importance is critical in human habitats and their scientific use is valuable.

Threats to bryophytes—

Destruction and degradation of habitat: There is loss and degradation of bryophyte habitat which have been occurring since long and caused by various both natural and man-made. Human activities like urbanization, road and dam construction, mining, conversion of forest to agricultural land, forest fire and overgrazing causes habitat destruction. Degradation alter the air and soil conditions causing pollution which affect the various bryophytes communities. *Takakia ceratophylla* is a vulnerable species found in Sikkim. It occurs in small fragmented area. They are threatened by human activities. *Calyptogenia aeruginosa*, *Cyathodium himalayanum*, *Lejennea kashyapii*, *Marsupella udarii*, *Metzgeria indica*, *Metzgeria sikkimensis* and *Kurzia tenerrima* are some of the endemic species found in North-east region. If their habitats are not conserved, this species will face a high risk of extinction.

The obligate epiphytic bryophytes that occur on trees, trunks, branches, twigs or leaves, fallen logs in various stages of decay are found in dense, undisturbed forest. Inappropriate forestry practices

like logging, thinning, clear-felling, replanting with non-native species, felling of old trees changes the original structure of the forest and thus led to the decrease in species diversity

The land having natural population of bryophytes is cleared off for agricultural purposes or road construction causing serious destruction of the vegetation. Bogs dominated by *Sphagnum* support specific kind of bryophyte community. The natural habitats of peat land community are altered by activities like peat extraction, damage by vehicles and destruction of surrounding forests etc. Tropical rainforests which has a very rich diversity of bryophytes are being cleared for human settlement and recreational activities. Burning has led to the elimination of many sensitive bryophytes.

Pollution: Bryophytes are very sensitive to pollution and slight changes in the quality of environment cause change in the community and injury to the plant. Sulphur dioxide (SO₂) is generally the most harmful component of air pollution for terrestrial bryophytes, causing chlorophyll plasmolysis (Coker 1967). Epiphytic such as *Erpodium mangifera*, *Macrothamniella* spp, *Rhynchostegiella humillina*, *Zygodon brevisetus*, *Macromitrium incrustatiformium* etc are endemic in north east region. Epiphytes are mainly sensitive to air pollution. It inhibits gametangial formation and sexual reproduction in bryophytes. Growths of aquatic species are inhibited by sewage and chemical waste (Empain *et al.* 1980). Heavy metals from contaminated water are accumulated to a greater extent by bryophytes. Acidification caused by wet atmospheric deposition of nutrients like nitrogen and sulphur produces drastic changes on epiphytes.

Water pollution has affected many bryophytes species growing in lowland riverine, aquatic systems (pools and reservoirs) and in many other wetlands. The enrichment of nutrients through nitrogen deposition leads to the eutrophication of these systems which affect the growth of the species. Many human activities like construction of

reservoir, water abstraction etc have disrupts the existing hydrology which is a potential threat to such habitats. Increased uses of herbicides and fertilizers have largely caused ephemeral and aquatic species to decline.

Ignorance:

Some of the bryophytes species such as *Marchantia*, *Frullanaia*, *Lejunia*, *Targionia*, *Anthoceros*, *Cyathodium*, *Riccia*, *Polytrichum*, *Funuria*, *Bryum* and *Sphagnum* form a prominent part of the landscape in northeastern region. They are popular class work material dealt with graduate and postgraduate level. These plants are required in large quantities for laboratory work. During collection generally the scientific suppliers and students studying various biological courses harvest the bryovegetation completely without leaving a single plant for regeneration. Unskilled people collect and destroy mosses in large amounts for orchards, nurseries and packaging material.

Invasive species: Invasive, introduced species of flowering plants and many other plants have a negative impact on the growth of the existing species of Bryophytes. Invasive species spread very fast at the places of disturbances and invade the sites of bryophytes by releasing allelopathic chemicals.

Some methods for the conservation of bryophytes:

Habitat protection: Many habitats which harbour threatened bryophytes must be protected from destruction and exploitation. Some measures must be taken up to reduce the adverse effects of off-road vehicles and pollution. Forest where the threatened species occur must be legally protected. To emphasize the use of bryophytes as “Bio-indicators” or as “Monitoring organisms” may maintain the protection of other bryophyte species or bryophytes habitats or both. Excessive use of herbicides and fertilizers in agricultural practices should be avoided and use of flora-

friendly agricultural practices should be recommended.

Educating the public: There should be good communication between bryologist experts and local communities so that they can help in the conservation of bryophytes. Students should be made aware of the important ecological role that the bryophytes played in the environment. Awareness can be raised through the use of education programmes e.g. highlighting bryophytes, videos, press coverage of bryological symposia/conferences/workshops and also popular illustrated field guides, etc. It is necessary to make an impact on the people that the extinction of any organism, including bryophyte is a warning that other extinctions will follow, which could directly affect them. During the excursions students should be asked to prepare drawing of the plants on the spot and recording of field data instead of individual collections of specimens.

Formulation plans: Bryophyte conservation should be integrated into mainstream conservation programmes so that the bryophyte communities are taken into account when habitat conservation is considered. To raise the profile of bryophytes, the bryophyte-rich habitats should be included into the appendices of international conventions. The accomplishment of this law is often inadequate and in some cases ineffective due to the insufficient support of the authorities. Collection in sensitive areas having endemic population should be made under the supervisions of experts, foresters and teachers. International cooperation among bryologists working with endangered species should be promoted. Proper legislation should be there to avoid mass harvesting.

Establishment of moss garden: Moss garden may be established at a place where the conditions are favourable. The population of threatened species and interesting species can be collected along with their substratum and are transferred to a garden. The compact nature and slow growth of

many mosses make a usable for developing a landscape.

In-vitro culture: In vitro- culture are useful for those species where spore production is low and population size is small. *Cryptomitrium himalayense*, an endemic and threatened species is successfully in-vitro propagated through spore culture for ex-situ conservation and maintenance of its in-vitro germplasm. Induction of callus took place when the young thalli or sporelings were inoculated into nutrient medium supplemented with 1% sucrose. In-vitro grown plants when successfully transferred to soil, obtained a good number of plants under controlled conditions (Awasthi *et al.* 2010). This has paved the way for the use of these plants for bioprospection studies and further they may be planted in their natural habitat for restoration of other interesting taxa.

Sound Financial assistance: The protection of habitats is not possible without sound financial assistance. Campaigns to raise the funds should be created in a way that many sponsors are concerned to bryophyte conservation. The campaigns should stress the significance of bryophytes in the ecosystem and in ensuring the well-being of humans

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Figure 1. A- *Anthoceros* spp. B- *Marchantia* spp. C- *Polytrichum* spp. D- Destruction of forest habitats. E- Destruction of natural habitats by human settlements. F- Mass collection by students. G- Road construction destroying natural habitats H- *Takakia ceratophylla*, a vulnerable species (image from internet). I- *Erpodium mangiferae*, an epiphytic moss sensitive to pollution

JUNGLE FILE

MEMORIES OF MANAS

Kripaljyoti Mazumdar

It was a sun-bleached morning of March 26, 2008 after heavy shower at night in the 'Uchila camp' of the Manas National Park. I always remember it as the best morning I had spent ever, throughout my working days inside the Park as we have sighted 10 troops of Capped Langur *Trachypithecus pileatus* within 3-4 hours of field trip on that particular day. Four of us; my friend Rakesh Soud, Niraj Sarkar, Bhuban Roy and myself, were on a mission of rapid assessment and documentation of the mammalian species of Manas under a photography and documentation programme, in collaboration with Forest Department and support from the Bodoland Territorial Council. One of the prominent Nature enthusiasts of Bongaigaon Mr. N.K. Dey – whom we fondly call Dey da, was the coordinator of the whole programme. I was interacting with Nandalal Narzary of MMES (Manas Maozigendri Ecotourism Society), who narrated to me about their experiences while working in this range of Manas, who along with other volunteers of MMES extended their helping hands to the Forest Department in protection and patrolling inside the eastern side of the Basbari range of Manas National Park. Nandalal was guiding us through the eastern part of Basbari range, as we were aiming for photographic and video-graphic documentation of the key mammalian species with the help of scientific methodology in the Manas World Heritage Site. It is a very unique

habitat, with huge diversity, both in terms of flora and fauna. Manas biosphere reserve spreads along the Himalayan foothills to the North, along the international border with Bhutan and a northeastern part bordering with the State of Arunachal Pradesh, merging with the mixed forest belt in both Bhutan and Arunachal. Uchila

View of road heading Uchila camp, Manas NP



(Photo: K. Mazumdar)

camp, covered by a mixed vegetation grassland and semi-evergreen forest behind, is one of the 12 forest department camps inside the Basbari range of Manas National Park. Basically, this camp was being maintained and run by the Forest Department and the Basbari Range office, with active support from the volunteers of MMES (Manas Maozigendri Ecotourism Society), Kokilabari, (Baksa district of Assam). I am writing about my very recent working days in Assam, in Northeastern India's first designated tiger reserve, the Manas Tiger Reserve (90°50' – 92°00'E longitude and 26°30' - 27°00'N latitude). It is perhaps a unique

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protected area among the protected area networks of India, in terms of its designation. Manas has the privilege of having five feathers under its cap. It was the first biosphere reserve in the State of Assam-notified in 1989, a National Park which constitutes the core area or core zone of the biosphere reserve covering three different ranges (Panbari range on the west, Basbari in the middle and Bhuyapara range on the easternmost part of the Park). It has been designated as a World Heritage Site by UNESCO in 1985, a site of incredible universal value. The entire biosphere reserve covers an area of 2837 sq km; the buffer area comprises of two wildlife sanctuaries viz. Bornodi wildlife sanctuary and Sonai-Rupai wildlife sanctuary and the entire biosphere reserve is under the control of six forest divisions.



A female Capped Langur (Trachypithecus pileatus) with its infant at Manas (Photo: R. Soud)

It also provides a good habitat for the Asian Elephant *Elephas maximus* and has been covered under the Project Elephant as one of the elephant reserves. Ranging over an altitudinal variation of 60-200 m msl, Manas provides a home to more than 60 species of mammals, 380 species of birds and more than 50 species of reptiles and 7 amphibians and 54 species of fishes so far identified. Landing

on such a tranquil domicile of Goddess Nature, one always feels complete. The same happened to me. I worked for around six months in Manas National Park and its fringe areas, dealing with the community conservation initiatives under a project funded by Darwin Initiative and implemented by the 'Pygmy Hog Conservation Programme (PHCP), named after one of the endemic species of Manas Biosphere reserve, before I moved to Western Arunachal Pradesh. The pygmy hog is the smallest suid found only in India and very much restricted to Manas only.

India's recognition as one of the four 'mega-biodiversity' countries of Asia is derived largely from two of its most important biodiversity hotspots- the Eastern Himalaya, along with the plains of Assam and the Northeastern and the Western Ghats in the peninsular India. Manas, harbouring some of the rare and endemic/ restricted species of fauna, is a distinctive region among the eastern Himalayan protected areas. The name of the Park originated from the Manas river, which is named after the Hindu serpent Goddess 'Manasa'. The river Manas is one of the major tributaries of the mighty Brahmaputra, which passes through the heart of the National Park. Actually, it bisects into two different streams- 'river Beki' and 'river Bholkaduba', just after it enters into India from the Bhutan foothill side. Of late, the Beki river has become the cause of heavy civil devastation in terms of floods near Narayanguri embankment, just adjoining the Manas National Park on its southern side. In the year 2007, the breaching of the embankment caused devastating floods, covering most of the areas of the Baska and Barpeta District of Assam. Even during my work, once I was about to get washed away by a flash-flood about a year back. The 2007 flood was so intense that Manas and its adjoining areas remained cut off from the main land for almost three weeks. It simply broke down and uprooted many bridges and culverts on the way to Manas and Manthanguri, making communication virtually impossible.

Even the wildlife of the Park and its nearby areas were severely affected due to the flood. But luckily, this time we were working during the pre-monsoon period.

Basically in Assam and other parts of Northeastern India, it is very hard to work during the monsoon period, from say the month of late May upto September. October to April is the best season to work, particularly for wildlife photography and to enjoy the eternity of Manas. During our rapid documentation, we had recorded a total of 31 species of mammalian fauna in the Basbari range and part of the Bhuyapara range. Prominent among them are Golden langur (*Trachypitecus geei*), capped langur (*Trachypitecus pileatus*), Hispid hare (*Caprolagus hispidus*), Pygmy hog (*Porcula salvania syn. Sus salvanius*), Royal Bengal tiger (*Panthera tigris*), Asian elephant (*Elephus maximus*), gaur (*Bos gaurus*) and the recently reintroduced greater one-horned rhinoceros (*Rhinoceros unicornis*).

Over the last two decades, the political unrest in Western Assam had lead to a devastating situation, especially in Manas, and it was seen in terms of the degradation of the forested lands and wild animals. This ethnic political and civil unrest in the area led to unchecked arson, poaching and looting in Manas upto the end of the last decade. The insurgency activities had taken a violent turn since 1988, leading to infrastructure linked breakdown; destruction of natural habitats, making protection a difficult task, this had even desolated the viable population of the one-horned rhinoceros in the midst of ethnic conflicts during the mid 1990s. But slowly, with the new initiatives in the first years of the new millennium and then after the signing of an agreement between the Bodo people and the Government of India in 2003 and subsequent formation of the Bodoland Territorial Council (BTC), the responsibility for management of the Park now rests with the BTC. The new conservation initiative has been praised by every section of the society due to its uniqueness, as it in-

volves the surrendered ultras of Bodoland Tigers (BLT) and the ex-poachers together for the cause of conservation.



The Vulnerable (Sambar Rusa) unicolor of Manas also need conservation attention (Photo: R. Soud)

With the help of a strong political will for the conservation of forests by the BTC leaders, like MMES, many other such conservation volunteers groups had come up during the course of time, where these volunteers are protecting their forest lands. Many of such groups are viz. BFPF-Kachugaon, Manas Agrang Society, Manas Ever Welfare Society, Ultapani Biodiversity Conservation Society, etc. Nandalal also belongs to the same background, who knows Manas more than us, who has lived there more than us, who loves Manas more than us; with the new conversion of slayer into the guardian of the greeneries which came up as a blessing for the World Heritage Site in danger, one hopes that it can regain its glorious past.

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(Similar article was published in *The Assam Tribune* on 14/06/2009 by the same author)



Shifting Cultivation: The Sole Livelihood of the People of Garo Hills, Meghalaya

Kiranmay Sarma

A considerable area (760 sq. km.) of the state of Meghalaya is under shifting cultivation (Fig. 1) and about 14 percent of the population of the state is involved in this slash and burn agricultural activity. The practice of shifting cultivation is highly prevalent in the Garo Hills both in terms of area (74%) and people involved (Table 1). This type of farming is normally practiced at altitudes between 100 and 1600 m in the region. It is a type of agroforestry, and is the most widespread farming system involving sequential rotation of forest vegetation and cultivated crops (Sarma, 2010). The Garo Hills of Meghalaya consist of three districts viz., East Garo Hills, West Garo Hills and South Garo Hills. The districts are bordered in the north and west by Assam state, south by Bangladesh and east by West Khasi Hills district of the state. The area is highly dissected with irregular terrain. The highest point of Garo hills is the Nokrek peak with an altitude of 1,412 m above msl. The total area of Garo Hills districts is 8,167 sq. km, which is 36.4 percent of the total area of the state. The tribal population of Garo Hills districts is 97.3 percent against the state tribal population of 80 percent. The practice of shifting cultivation is locally known as 'Jhuming' which is practiced extensively on the hill slopes in all parts of the Garo Hills except at low elevation areas where they have settled agriculture especially western,

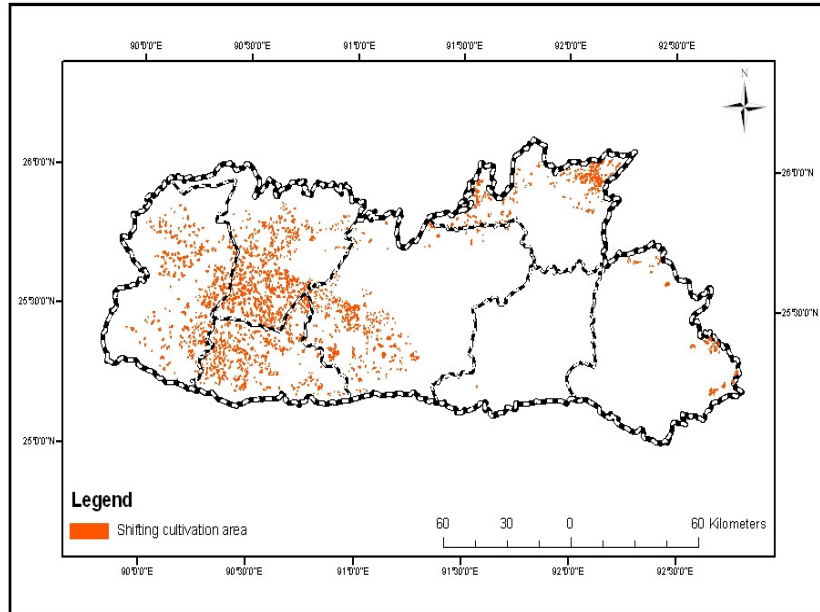


Fig. 1: Map showing the current shifting cultivation areas of Meghalaya

southern and eastern parts bordering Bangladesh and Assam. Because of the hilly terrain, settled cultivation is practiced only in small pockets mostly confined to the valleys. In view of the high labour cost and energy input involved in terrace cultivation, and in absence of other viable alternatives to shifting cultivation, the majority of the population of the state continues to depend on shifting cultivation for their subsistence livelihood. Jhuming has resulted in large scale deforestation, soil erosion, nutrient loss and invasion of weedy and other species. These activities have ultimately affecting to the biodiversity at large extent.

The general process involved in Jhuming in Garo Hills includes slashing of vegetation during November-December, burning in February-March and then sowing of seeds by dibbling method. The major crops are like cereals, vegetables and oil seeds. They will continue cultivation for few years and then the land will be abandoned and they will

tion, even on steep hill slopes, compared with any other land clearing and tillage system (Lal 1987 and Forsyth 1994). Soil erosion is minimized by a brief period of exposure of the soil after burning, mulching, negligible or no tillage and traditional preventive measures like horizontal placing of unburnt logs across the slope (Mertz 2002). The

Table-1: Number of jhumias in Garo Hills districts and the state of Meghalaya

Name of District	Total Popln. (Rural)	No. of Families dependent on jhum	Population dependent on jhum	Percentage of the jhumias to the total rural population
East Garo Hills	2,11,652	13,630	68,150	32.20
West Garo Hills	4,57,422	18,086	90,430	19.77
South Garo Hills	90,462	7,900	39,500	43.66
Meghalaya	18,53,457	51,428	2,57,140	13.87

[Source: Soil & Water Conservation Department, Government of Meghalaya, 2000]

shift for new area and later returning to the same site. Frequent shifting from one land to other has affected the declining area under natural forest, forest fragmentation, disappearance of local species and invasion of weedy species. In the districts of Garo Hills abandoned fields are recovered by the fast colonizing species like *Macaranga denticulata*, *Callicarpa arborea*, *Schima wallichii*, *Bauhinia variegata*, *Albizia procera*, *Albizia lebbeck*, *Mikania micrantha*, *Eupatorium odoratum*, *Thysolaena* sp., and Bamboo species. The Jhuming cycle of the districts has reduced to 3-5 years. Shifting cultivation is largely practiced on lands owned by communities, clans and also on lands under the administrative control of the Autonomous District Councils. A small area in some reserve forests and protected forests of the districts are also affected by this practice.

Scientific literature has generally condemned it as destructive to the soil, forest and biodiversity. This is sometimes also upheld as an evidence of how indigenous people have blindly destroyed their environment. Agricultural experts allude to the presumed unsustainability of this type of primitive agriculture to justify agricultural modernization and development. However, several studies have shown that traditional methods of shifting cultivation causes the lowest amount of soil ero-

environmental impact of shifting cultivation depends more on the length of fallow and the pace of regeneration of the forest during fallow period than on the standard slash and burn activity. The Jhum cycle in the past varied from 20 to 30 years but due to the increase in population the Jhum cycle has now been reduced to around 3 to 5 years (Sarma, 2010).

Cropping Pattern of Jhum

Mixed cropping is a common feature in shifting agriculture. Yam, cucumber, watermelon and other vegetables are commonly grown during the kharif season while during the rabi season beans, cabbage and mustard are grown in the same plot of land. The main crops under jhum cultivation are rice, maize, millets, oil seeds and cash crops. About 40 to 71% of the area of different districts of the state is utilized for cultivation of rice, 8 to 16% area for other food crops, 0.3 to 8.0% for oil seed crops and 14 to 40% for cash crops. Wheat and small millets are grown in East and West Garo Hills districts and potato is grown only in 1-2% of land. In the Garo Hills, tapioca, jute, mesta, cotton and banana are the major cash crops. Sesame, rape and mustard are the major oil seeds grown in jhum lands (Sarma, 2010).



Fig. 2 A view of Jhuming in Garo Hills



Fig. 3 A view of Jhuming in Garo Hills



Fig. 4 A view of early abandoned Jhum



Fig. 5 A view of late abandoned Jhum

The result of a remote sensing based study (Sarma *et. al*, 2010) reveals that 4,688 sq. km (57.40%) area is under forest cover of dense, open and bamboo brakes. The vegetation of Garo Hills is represented by either tropical moist and dry deciduous or sub-tropical broad-leaved forests. The area under dense forest cover is 4.23 percent which is 345.50 sq. km while open forest covers an area of 4,255.60 sq. km (52.11%) of the total area of Garo Hills. An area of 37 sq. km (0.45%) is occupied by plantations of Casua nut, rubber, teak, areca nut and coffee. The area under bamboo brakes is about 50 sq. km which is 0.6 percent of the total area. The remaining areas of 3,479.1 sq. km which is 42.60 percent of the total Garo Hills area is under non-forest. Out of the total non forests areas an area of 208 sq. km (2.6%) is under current shifting cultivation. The remaining non

forest areas include abandoned shifting cultivation areas, grasslands, degraded lands, settlement areas, permanent agricultural lands, roads, mining areas, water bodies, rivers and sand bars (Fig. 6).

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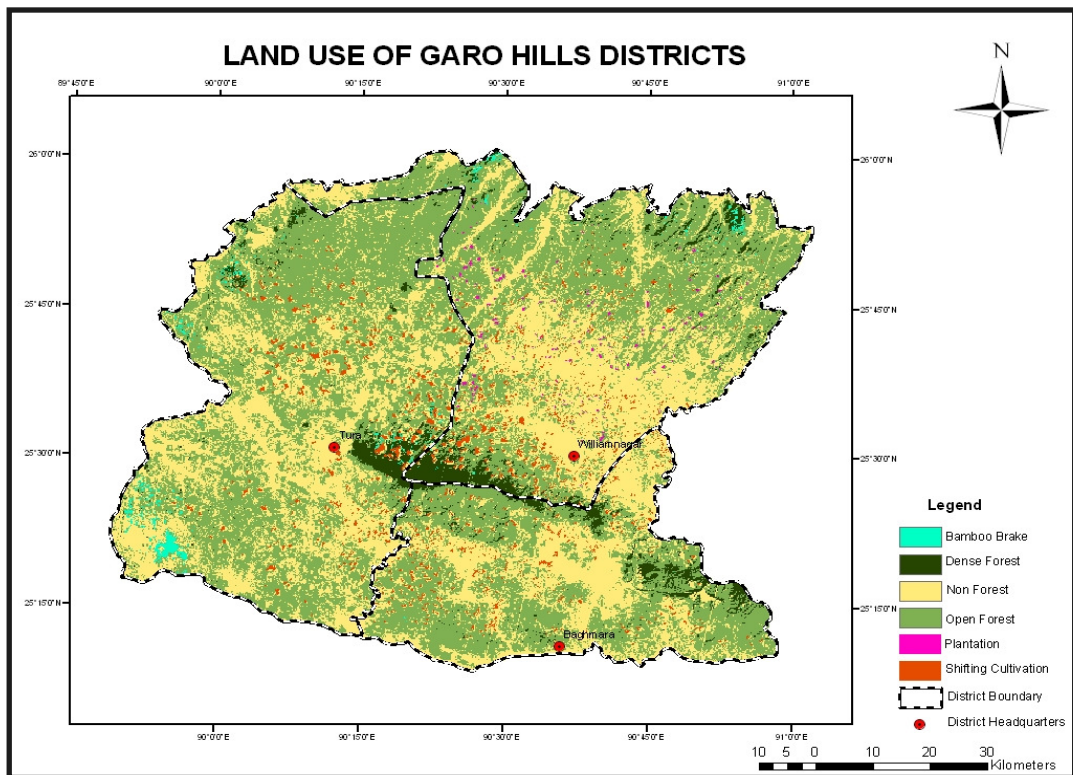


Fig. 6: Map showing different forest types and land cover in Garo Hills districts of Meghalaya (after Sarma et al., 2010)

GUEST COLUMN

SPECIAL FEATURES ON BHITARKANIKA

Bijay K. Nanda



The resilient mangroves in Bhitarkanika serve the protective functions to a greater extent. It protects the hinterland against cyclonic storms during cyclones, super cyclones, tidal surges and other natural catastrophes acting as an effective shelterbelt. In the unprecedented super cyclone of October 1999, the mangroves has withstood the onslaught of cyclonic wind and saved the life and property of millions of people.

Mangrove wetlands perform a variety of productive as well as protective functions. This mangrove

wetland in particular is a repository of biological diversity in terms of flora and fauna.

This ecosystem harbors the largest number of saltwater crocodile population in the Indian sub-continent. Other reptilian fauna include Monitor lizard, Indian python, King cobra and varieties of other snake species. It also harbors a number of endangered animals like Fishing cat, Leopard cat, Dolphins and Porpoises.

Bhitarkanika's famous Gahirmatha coast finds a prominent place in the turtle map of the world because of the distinction of having one of world's largest nesting and breeding congregation of Olive Ridley Sea turtles.

Mangrove wetlands including mudflats provide ideal feeding, perching and nesting facilities to a variety of resident and migratory waterfowl. Coastal Orissa has much to offer beyond agriculture. It has a great potentiality for different growing segments of tourism like eco tourism, adventure tourism, health tourism, farm tourism, endogenous tourism, nature tourism, cultural tourism, religious tourism and the like. That such coastal tourism can improve the income of coastal folk is beyond doubt. The issue is of coastal eco-villageled tourism on a sustainable basis. Different facets of nature allure tourists. It is, therefore, advisable that nature is to be maintained in its true form. The Orissa region offers good scope for eco and adventure tourism. Infrastructure for coastal tourism should be developed in such a manner to retain the sanctity of the natural landscape.

Located in the District of Kendrapara, between Longitudes 860.30' to 870.06'(East) and latitude 200.30' to 200.50' (North), Bhitarkanika Sanctuary spreads over an area of 672.00sq.km., including the National Park area of 145.00sq.km. Other details are as follows:

- Forest type Mangroves: Rizophora, Heritiera Xylocarpus etc.

- **Number of villages and total population:** 381 villages 1.96 lakh people
- **Climate:** Minimum winter temperature is around 10⁰ C; Summer Maximum - 43⁰ C.
- **Wild animals to be seen:** Leopard Cat, Fishing Cat, Jungle Cat, Hyena, Wild Boar, Spotted Deer, Sambar, Porcupine, Pythons, Dolphins, King Cobra, Saltwater Crocodiles Including Partial White (Sankhua) Crocodile, Water Monitor Lizard, Terrapins, Marine Turtles, Kingfishers, Wood Peckers, Hornbills, Bar-Headed Goose, Brahminy Ducks, Pintails, White Bellied Sea Eagles, and a variety of resident and migratory birds.

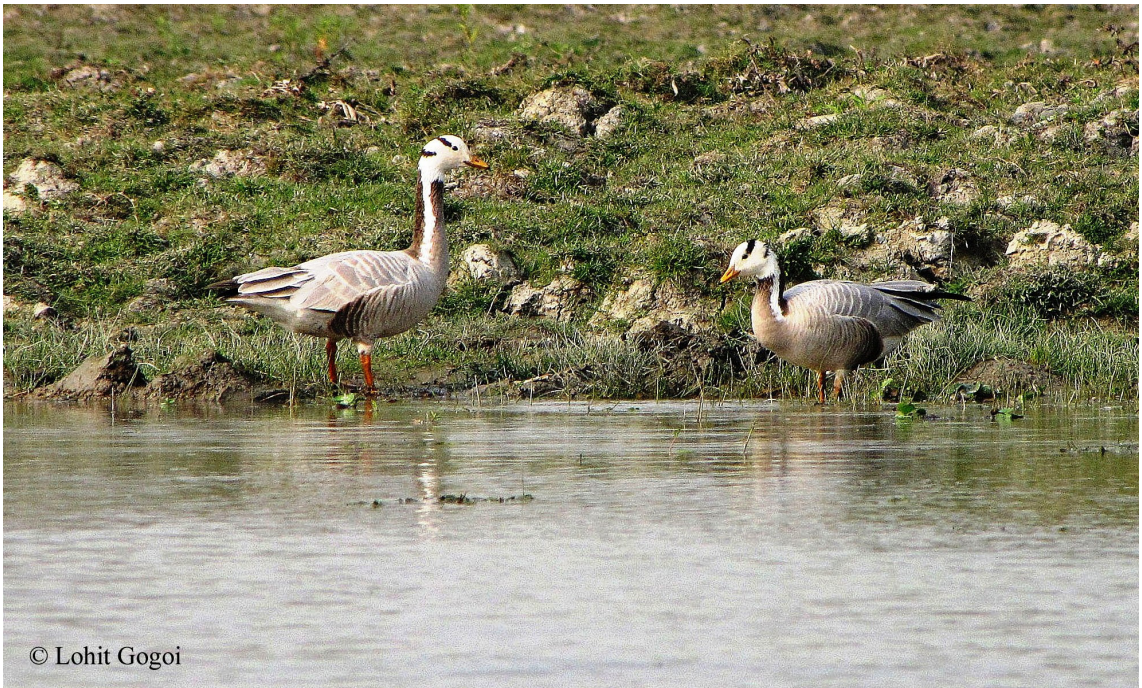
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Suitable period of visit: Winter and early summer months (October to mid April).

THROUGH THE LENS



© Lohit Gogoi

Bar Headed Goose (*Anser indicus*) at Kanchanjuri beat of Kaziranga National Park. This species is one of the highest flying birds (above 33,000 ft.), migrates over the Himalaya from Siberia via the Qinghai lake region in China to spend the winter in Indian subcontinent (from Northern Burma, Assam to Pakistan).

Photograph: Mr. Lohit Gogoi, Wetland Officer, WWF-India, Western Arunachal Landscape Program

ORGANIZATIONAL REPORT ENVIRON, Guwahati

A step to clean up PET Bottle junk from Itanagar City:

Deputy Commissioner of Capital Complex, Itanagar Dr. S B Deepak Kumar formally inaugurated much needed PET Bottle Collection Programme from DC office premises on 14th September with an aim to make PET bottle free city. ENVIRON a reputed organization and already working on Solid Waste Management in city, now gear up to make city free from plastic wastes, for this ENVIRON organized a group of rag pickers and they will take up the collection process from roadside, drains and garbage bins. It has been observed that tons of plastic waste dumps near roadside, in drains and garbage bins which creating unhygienic environment. Not only this it quality of non biodegradable, these product becoming massive concern for human race because of this feature which date orating the quality of soil for now and also for many hundred years.

earn extra amount by collecting and selling this product to recycling factories. In other hand we can generate money from waste product.

Whole PET Bottle Collection Programme will be carried out under the close supervision of ENVIRON in association with District Admini-



stration, Itanagar.

On an average at least fifty kilos of PET bottles are collected per day from different part of the city. This small figure indicates in what average plastic bottle waste is raising and need to take up serious step to keep city clean from such junk. To support this programme district administration handed over two hand cart to ENVIRON for the rag pickers. To begin with firstly the collection was carried out from DC office premise. In region, still there is a need of awareness among the people, such as to use litterbins and to change its careless attitude or behavior of the people throwing anything in anywhere which cause dirtiness in surrounding. Until we change our habit or behavior we cannot save our environment.

(Press release: Arunachal Pradesh State Unit, ENVIRON)



The alternative option to least its impact on soil is to recycle, hence its need man power to collect these bottles, even this provide an opportunity for people living in marginal per capita income to

**World Environment Day 2010
Celebrated by ENVIRON in Parijat
Academy and B. Borooh College,
Guwahati.**

The World Environment Day 2010 was celebrated by ENVIRON, a prominent group of Northeast



India engaged in conservation of nature and biodiversity simultaneously in B. Borooh College Guwahati-07 and Parijat Academy, Guwahati-35 with this year's theme 'Many Species, One Planet, One Future' with the financial support from Assam Science Technology and Environment Council (ASTEC).

In Parijat Academy the programme was conducted in collaboration with Panchtatva, Gauhati University. The programme commenced with the elaboration of the significance of the World Environment Day and this year's theme by Mr. Kripaljyoti Mazumdar, Coordinator, Division of Wildlife and Biodiversity Conservation, ENVIRON. Mr. Uttam Teron, Principal, Parijat Academy, welcome all the students and urged them to work for conservation of nature and natural resources. Then after, an Extempore Speech Competition was organized among the students. Ms. Trishna Sarma, Researcher, Department of Zoology, Gauhati University and Mr. Kaustubh Rakshit of ENVIRON coordinated the competition among the students. Mr. Kripaljyoti Mazumdar, Ms. Trishna Sarma and Mr. Kaustubh Rakshit on be-

half of ENVIRON handed over a bundle of 17 books on various environmental and popular science including two Science Dictionaries to Mr. Teron for the Library, Parijat Academy. The programme concluded with a Vote of thanks from Mr. Teron and he hope that ENVIRON will conduct such environmental workshop for children in near future too.

World Environment Day celebration programme at B. Borooh College Guwahati was organized by Environ in collaboration with SYNAPSE, B. Borooh College and Panchatatva, Gauhati University. The programme gets off the ground with a plantation programme by Dr. Dinesh Baishya, Principal B. Borooh College and a Drawing competition programme among the school students. Dr. Baishya delivered a talk on the Water scarcity & environmental damage caused by Open Cast Mining in Patkai region. Mr. Bidyut Bikash Sharma of Panchatatva, Gauhati University discussed about the Climate change issues in India. A documentary film on Environmental issue was also



screened in the afternoon and Mr. Kripaljyoti Mazumdar of ENVIRON spoke on the role of youth in mitigating & challenging Climate change scenario during the evening hour discussion.

(Press release: Assam state unit, ENVIRON)

ORGANIZATIONAL REPORT NECEER, Imphal, Manipur



NECEER'S ENVIRO LECTURE SERIES

19th September (Sunday) 2010
Faculty of Engineering & Technology Auditorium
Jamia Millia Islamia, New Delhi

EXPLORE NORTHEAST INDIA

Organised by
North East Centre for Environmental Education and Research, Imphal
in association with
Department of Biotechnology, Jamia Millia Islamia, Delhi
Delhi Greens and World Institute of Nature, Pune

The first phase of “NECEER’s Enviro Lecture Series” was successfully conducted on 19th September (Sunday) at Faculty of Engineering Auditorium, Jamia Millia Islamia, Delhi. The lecture was organized by the Northeast Centre for Environmental Education and Research (NECEER, Imphal in association with Department of Biotechnology, Jamia Millia Islamia, New Delhi, World Institute for Nature, Pune and Delhi Greens, New Delhi. Many young enthusiastic students and research scholars attended the lecture series which highlighted various wildlife and environmental issues in the Northeast region of India. The event brought together prominent figures who are concerned and have worked in the region to share their experiences and thoughts with the young generation. The objective of the programme was to lay stress and disseminate information on biodiversity and environmental issues today in the age of climate change and other anthropogenic

consequences in one of the most important hot-spot region of the country i.e. Northeast.

The programme started with keynote address by Mr. Khuraijam Jibankumar Singh, Managing Trustee, NECEER, Imphal. He talked on the need of setting a platform for creating awareness and engaging people who are into research and education to come together and work for the conservation of rich biodiversity and discuss environmental issues of Northeast India. He also elaborates the future plans of the lectures series which will play an important role in promoting the involvement of youth in environmental issues.

Young Achiever Award which is initiated by NECEER, Imphal to address the extraordinary work of young Northeast Indian for their outstanding contribution towards conservation/promotion of biodiversity and environment of the country. Young Achiever Award for the year 2010 was presented to Ms. Girija Thingnam by Dr. Sandeep Kumar Tiwari, Head, Wildlands, Wildlife Trust of India. Ms. Girija Thingnam is a flower enthusiast from the state of Manipur and is a special educator and has a Masters degree in Psychology and a Diploma in Special Education (Autism).



Ms. Girija Thingnam receiving Young Achiever Award 2010 from Dr. Sandeep Kumar Tiwari, Head, Wildlands, Wildlife Trust of India

She got the award for her exemplary work on flowers of India in the form of a website (www.flowersofindia.net). The website is the brainchild of Dr. Tabish Qureshi, Associate Professor, Dept. of Physics, Jamia Millia Islamia and Ms. Girija. Speaking on the success of www.flowersofindia.net, Dr. Tabish Qureshi declared the website now have a collection of more than 3000 flowers.

The programme also witnessed the release of BioDiverse Magazine by Dr. Rita Singh, Associate Professor, G.G.S. Indraprastha University, Delhi. BioDiverse Magazine is the third publication of NECEER, Imphal.



Release of BioDiverse Magazine by Dr. Rita Singh

The objective of the magazine is to disseminate information on the various biodiversity and environmental issues of South and Southeast Asia. The magazine will provide a strong platform to undergraduate, postgraduate as well as research scholars to communicate by sharing their thoughts in the form of articles, news, poems, cartoons, and other graphic illustrations.



Dr. Tabish Qureshi, Jamia Millia Islamia

The lecture programme started with a lecture on “Conserving issues of wildlife in Northeast India” by Dr. Sandeep Kumar Tiwari, WTI. He talked on the importance of the region in terms of its rich biodiversity and how the region supports numerous wildlife species. He opined that the greatest challenge faced by the region is lack of awareness and lack of people’s participation. Many interesting facts about the kinds and numbers of wildlife species found throughout the region were highlighted.



Dr. Sandeep Kumar Tiwari, Wildlife Trust of India

Presenting the other side of the diversity, Dr. Rita Singh, Associate Professor at GGS Indraprastha University, shared with the delegates through many exciting facts and figures of the plant species found across the region. Dr. Singh encouraged young students and research scholars to be passionate enough and take up the challenge to go out in the region and experience the richness. She also talked about how many have failed to comprehend the region’s rich diversity and neglected the real importance in pursuit of personal gains.



Dr. Rita Singh, GGS Indraprastha University

Illustrating the relation of biotechnological applications in biodiversity conservation, Dr. Mohd

Irfan Qureshi, Assistant Professor, Dept. of Biotechnology, Jamia Millia Islamia shared his knowledge and views with the audience.

After the lunch break, another known figure Dr. Kiranmay Sarma of GGS Indraprastha University enlightened the audience with his expertise in the field of remote sensing and the relevance of GIS in conservation and protection of environment. Taking the audience through various methodical process and facts, Mr. Sarma challenged the delegates to identify pressing issues and come up with relevant solutions towards saving the environment.



Dr. Kiranmay Sarma, GGS Indraprastha University

The next hot topic of the lecture series was addressed by Govind Singh of Delhi Greens. Climate change and its impact on the Northeast region, a highly interesting topic for many participating delegates highlighted issues that the world as a whole is facing and how it is 'our common environment' which needs to be protected. Giving a brief introduction to what climate change is all about, Mr. Singh spoke on the importance of the Northeast region as the 'Green Lungs' of the country. The challenges faced by the region and how its preservation can impact and bring tremendous change in saving the environment of the country as well as the world as a whole was emphasised.

Mr. M. Ojitkumar Singh, Assistant Professor, Department of Zoology, Ramjas College, University of Delhi talked on the impact of climate change on the biodiversity of Northeast India. He gave a detailed list of endangered species of Northeast India which are affected by change in the climate and environment of the region.



Govind Singh, Delhi Greens



Mayanglambam Ojitkumar Singh, Ramjas College

A documentary titled "Loktak Lake – the lake in peril" by R.K. Robindro, a renowned filmmaker was screened during the event. The film displayed issues faced by the Lake and how human activities are affecting the natural heritage of Manipur state often referred to as the "Lifeline of Manipur". The Lake's importance doesn't only limit there, it supports one of the largest vegetation called *Phumdi* which provides natural habitat to the endangered brown antler deer 'Sangai', found only in this region.

Mr. Khuraijam Jibankumar, Managing Trustee of NECEER, Imphal talked on a very sensitive topic - Hindrances of biodiversity conservation due to political instability in Northeast India. With his experiences of working in militancy affected areas of the region, he expressed the violations of wildlife laws are the highest in this region. Hundreds of endangered species are killed silently inside the militant affected areas without the notice of the policy makers and forest departments. He said that biodiversity exploration studies in the region and creating awareness to well armed militants are one of the riskiest thing a conservationist or

researcher faced in the region. In spite of all the hindrances, he said biodiversity of the region should be conserved and protected.



Khuraijam Jibankumar Singh, NECEER, Imphal

The lecture series conclude with a vote of thanks by Khuraijam Jibankumar Singh who was the main person behind the lecture series. He announced that lecture series next year will be of two days: "Enviro Lecture Series" and one day "National Seminar on Biodiversity and Environment of India" where students and researchers can participate and present their works. He also seeks support from youth of the country to join the ongoing Worldwide Save Loktak Lake Campaign and help in conserving Loktak Lake, the natural heritage of the Manipur.



Participants with speakers

With the participation of maximum number of youth and of course the environment lovers, the lecture series proved to be a great success.

It is to be noted that NECEER have been organizing various successful campaigns on a row like the ones of "Nationwide Save Sangai Campaign" and

the famous "Worldwide Save Loktak Lake Campaign (WSLLC)" which is still ongoing. It can again be mentioned that WSLLC has successfully completed its first and second phases in the cities like Imphal, Delhi, Mumbai, Guwahati and the like. And the third phase will be organized shortly in the cities like Bangalore and Chennai among others. NECEER, Imphal also publishes journal, newsletter and magazine. NECEER, Imphal is involved in many initiatives to conserve and protect fragile ecosystems like sacred groves and wetlands in Northeast India. NECEER is launching self-financed projects to study the socio-economic dependence of local people on Loktak Lake.

NECEER is a non-profit organization which is expanding its wing day by day not only in the country but internationally too. This achievement could be credited due to the youth involvement across the world. NECEER now has 600 volunteers and 32 city co-ordinators besides thousands of supporters across the world to support the causes that NECEER takes up.

In brief.....

Delhi Youth Summit on Climate 2010

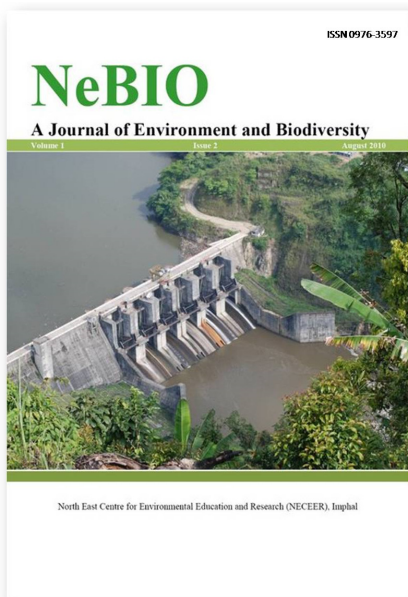


NECEER, Imphal was one of the organizing partners of the Delhi Greens' Delhi Youth Summit on Climate 2010 which was held at Teen Murti House, Delhi on 5th and 6th June 2010.

National Seminar on Social Movements in Contemporary India



Khuraijam Jibankumar Singh, Founder of NECEER, Imphal delivered a talk on Worldwide Save Loktak Lake Campaign at the National Seminar on Social Movements in Contemporary India organised by Council for Social Development (CSD), New Delhi on 15th and 16th July, 2010 at The India International Centre, New Delhi.



NeBIO Volume 1 issue 2
August Issue

NeBIO Journal: New Advisors

Dr. Ramakrishna, *Director, Zoological Survey of India*
Dr. Asad Rahmani, *Director, Bombay Natural History Society*
Dr. Nigel Collar, *Birdlife International, UK*
Dr. Partha Sarathi Roy, *Dy. Director, National Remote Sensing Centre*
Dr. S. Krishnan, *Scientist-E, SRC/ZSI, Chennai*
Dr. M. Ahmedullah, *Chair, Indian Subcontinent Plant Specialist Group, IUCN*
Head/Scientist In-charge, Botanic Garden of Indian Republic

Announcement

3rd Issue (October Issue): 15th November 2010 (date of publication)
Articles are still accepting for 4th issues. Last date of submission 15th Nov. 2010
4th Issue (December Issue): 15th December 2010 (date of publication)

Contributing authors

Corresponding authors should be subscriber of the journal and member of North East India Biodiversity Network (NEIBN).

For details and instructions to authors, please visit:

www.necceer-imphal.blogspot.com

or contact

Khurajam Jibankumar Singh

Editor-in-Chief at nebio.editor@gmail.com

UPCOMING EVENTS

Global Conference on Entomology (GCE 2011) March 5-9, 2011, Chiang Mai, Thailand

The main objective of the Global Conference on Entomology is to showcase advances in entomological research and development in the insect world. The skills and knowledge of entomologists are needed worldwide helping farmers to produce crops and livestock more efficiently through sound pest management strategies, fighting to save endangered species and fragile ecosystems, and preventing insects from spreading agents that cause serious diseases.

For further information:

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GCE Secretariat, Century Foundation, No. 1,
Jagajyoti layout, (Behind VSS International School),
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Phone: +91(080) 22961315, +91 9845056044
Fax: +91-80-23181443. Website: www.entomology2011.com

2nd International Conference on ECOLOGICAL THEOLOGY AND ENVIRONMENTAL ETHICS (ECOTHEE 2011) 1 June 2011, Chania, Greece

EcoTHEE11 conference addresses the need for human response to ecological crisis. It seeks to engage theology on key ecological concerns from a variety of Christian traditions and perspectives. We are interested in multi-disciplinary exchanges and insights, with a focus on religious-based and scientific approaches to environmental issues and

Readers,

You are welcome to contribute articles, photographs with details, news or in any other form pertaining to the regional environment and development related issues, North eastern region for publishing in our subsequent issues.

Please send your views and opinions to

The Editor, Ecotone at ecotone.editor@gmail.com

human responsibility. The deadline for abstracts/proposals is 31 January 2011.

Contact: Dr. Lucas Andrianos

E-mail: laoac@otenet.gr

Website: <http://ithe.webs.com>

Sponsored by: Institute of Theology and Ecology of the Orthodox Academy of Crete

SERC SCHOOL IN CHRONOBIOLOGY 2011 24th Dec. 2010— 07 January 2011

The Department of Science and Technology has been organizing the SERC School in Chronobiology for the past eight years. The current ninth school is first of the series III of this activity, named the SERC School in Chronobiology III: Clocks, Rhythms and Behaviour.

Who can apply: Final year M. Sc./ MBBS/ M. Pharm./ B. Tech students, Ph. D. Scholars, Post-docs and Young faculty.
Application deadline: 31st October 2010

For Detail Contact: **Prof. Vinod Kumar**, Coordinator
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