

Vol 14. No. 1 & 2 - 2017

# BI LINK

connecting biodiversity

A quarterly newsletter



**Conservation of Kuls:**  
a race for survival  
between species

**Climate Change  
and its impact;  
a case study of  
Dihiri village  
in Dhemaji district**

**Shifting from  
Human-Wildlife conflict  
to Co-existence**

**Importance of  
Bird Conservation  
in non-protected areas**

*Aaranyak*

Nourishing nature to secure our future

### ABOUT AARANYAK

Aaranyak is a registered society working towards nature conservation in North East India, since 1989. Our strength lies in applied research in biological and social fields and our thrust area of work is the North Eastern India and Eastern Himalayas.

### MISSION

Our mission is to foster conservation of biodiversity in Northeast India through research, environmental education, capacity building and advocacy for legal and policy reform to usher a new era of ecological security. Know more about us at [www.aaranyak.org](http://www.aaranyak.org).

### COVER PHOTOGRAPH

Photo Credit: Ashok Das

The species in the cover photo is Jungle cat (*Felis silvestris*), photographed in Pobitora Wildlife Sanctuary, Assam.

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### Acknowledgement:

The Biolink is published with support from The Rufford Small Grants Foundation



## CONTENTS

### FEATURES



#### 2. Conservation of Kulsis: a race for survival between species

- Sunny Deory

The author discusses about need of conservation of the Kulsis River. Which is home to a small population of Ganges dolphins.



#### 4. Climate Change and its impact; a case study of Dihiri village in Dhemaji district

- Masfique A. Hazarika

The article throws light on how flash flood impact the education system of Dihiri Chapori, a village situated near the bank of Jialhal river.



#### 6. Shifting from Human-Wildlife conflict to Co-existence

- Dora Godinho

The author narrates how elephant conservation project successfully impact in reducing human elephant conflict in Subankhata.



#### 8. Importance of Bird Conservation in non-protected areas

- Rehan Ali

In the article, the author explains the need of bird conservation in non-protected areas and few steps by which any birder can take to promote bird conservation locally.

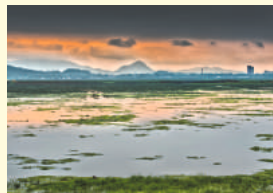
### SPECIAL FEATURE



#### 11. Photo essay & poster

- Ashok Das

This photo essay presents some of the key wildlife attractions of Pobitora.



#### 15. আৰ্দ্ৰভূমিৰ গুৰুত্ব, অস্তিত্বৰ সংকট

আৰু সংৰক্ষণৰ প্ৰয়োজনীয়তা

—প্ৰব্ৰজ্যোতি কলিতা

উক্ত লিখনিটোত লেখকে অসমৰ সৰু-বৰ

আৰ্দ্ৰভূমিসমূহৰ গুৰুত্ব সম্পৰ্কে ব্যাখ্যা আগবঢ়াইছে।

এই আৰ্দ্ৰভূমিসমূহৰ সংৰক্ষণৰ হকে সকলোকে আগবাঢ়ি আহিবলৈ অনুৰোধ জনাইছে।

### MORE



#### 10. Participants' Speak

#### 19. Glimpses of Aaranyak's work

#### 22. Nature Talk

(Featuring Kulada Kumar Bhattacharjee)

# EDITORIAL

Starting from a nature club formed by handful of nature lovers to one of the largest Scientific and Industrial Research Organization in India, Aaranyak is now at its 28<sup>th</sup> year of existence. While the core mission of working for conservation of nature through research, education, capacity building and advocacy for policy reforms stays the same, the organization has undergone changes. From backyard birding activities in the early days to a multidisciplinary approach of research based conservation is a process of evolution that demanded dedication and sacrifice of several individuals, who have proven themselves to be leaders in their own field of work. Similarly, from a small organization managed entirely by handful of volunteers to a setup enhanced by administrative and finance professionals to support activities of more than a hundred full-time staff today is a measure of success in itself. Many accolades came in from time to time, at regional, national or at international level, as recognition to the achievements made by the organization or exemplary leadership being shown by some of its workers.

As a population geneticist, I understand well the necessity of maintaining the genetic diversity of a species, in order to maximize the possibility of its survival for longer generations. While this statement may sound bizarre while writing on how an organization has evolved, it's actually not! With my own ten years of working in Aaranyak, I have seen that it is the diversity of approaches that has kept Aaranyak distinct amongst other organizations sharing the same niche and ensuring its survival. Thus, we need to enhance our diversity further by bringing in people with varied experience to work with us and provide them a platform to strengthen the core of the organization.

Sometimes, diversity remains underestimated and talents remain hidden, in the absence of a conducive environment! Some of our staff have demonstrated that their auxiliary skills are more valuable for the organization at times, than their very professional training! I think it is the responsibility of the senior generation of Aaranyak to promote expression of such skills, in order to provide support for better utilization of multi-talented manpower by the organization. The same can be applied to our members and therefore it is imperative that our members also communicate to us and keep us informed on their interests and skills.

Thus, when resources are limited to support additional manpower, communications within the organization and with its members and well-wishers is of vital importance. We all must create an environment and promote each other, so that everyone feels confident about their association with Aaranyak and encouraged to stay self-motivated.



(Udayan Borthakur)

# Conservation of Kulsi: a race for survival between species

Sunny Deori

The existence of the word 'Conservation' of anything on this planet is true only till that certain 'anything' survives. And 'anything' is again, as we all know, not alone in this world. They have connections which will either flourish or diminish their population. So we can basically say that conservation will be a success story if and only if we consider the conservation of 'anything' along with all connections in this world.

To generate a more realistic picture let me introduce you to a small tributary of Brahmaputra, the Kulsi River. Kulsi, which is famous for the charismatic species of Ganges dolphins, is one of the smallest tributaries of Brahmaputra originating from a trident of three rivers at Umkiam of Meghalaya. It enters Assam at Kulsi village and confluences with Brahmaputra at Nagarbera after traversing for about 72km.

Kulsi River is home to a small population of Ganges dolphins along with more than 200 species of fish, which includes many endemic and ornamental fish and several species of turtles and water birds. Recent surveys (2011-2014) reveals a population estimation of about 25- 35 dolphins in Kulsi river. After a drastic decline in its population worldwide due to various factors and most importantly anthropogenic pressures, it has been declared as Endangered by International Union for Conservation of Nature (IUCN) and Scheduled 1 species under Wildlife Protection Act (1972). Thus it has been ordained with the highest level of protection at present. Apart from this it has also been recognised as the State Aquatic animal of Assam in 2008 and National Aquatic animal of our country in 2009. Dolphins are aquatic mammals and a top level predator in the freshwater ecosystem whose presence in any fresh water river system is a sign of the good health for the entire ecosystem. Unfortunately, people have been posing serious threats to the animal, either directly or indirectly.

Water pollution caused by industrial waste discharge or household garbage; constructions of dams and barrages; transportations through ferries and motor boats etc. have led to extreme habitat destruction of dolphins. On the other hand, fishermen communities impose prey-

predator competition by introducing harmful fishing gear like mosquito and monofilament gill nets. Even intentional killing for oil extraction from dolphin's blubber for fishing practices or remedies for rheumatic disease as superstitious believes or for meat etc. are aiding in direct shrinkage of the population.

Unlike most of the endangered terrestrial mammals which are protected under demarcated boundaries of sanctuaries, parks and reserves, this particular species habitat is the most difficult one to safeguard. As the river flows towards it confluences with another bigger water source, it covers various mosaics of landscapes and people residing along its bank. Hence, it is more vulnerable to human generated threats. For instance, Kulsi River traverses through an altitudinal range of more than 4000 ft in Meghalaya to about 1800 ft in rural Kamrup district of Assam with riparian types ranging from matured forest to shrub lands and cultivated lands. It is also populated with various communities of people along its bank, for most of whom the river is their lifeline. The river serves as source of water for irrigation, transportation, fish and minerals in the form of sand to the people residing on the banks of the Kulsi River. The fishermen communities of Kulsi have been present there since time immemorial and the sand miners for more than past fifty years.

Since then the population in villages have bloomed and consequently the pressure on the Kulsi River has also multiplied. To list few of the added pressures on the ecosystem of the Kulsi, the irrigation facilities have been upgraded to fuel or electricity generated motor pumps; number of motor boats for transportation have increased; fishermen have scaled up their fishing gears to improve their catch quality as well as quantity; hand extraction is gradually converting to pump extraction of sand from river bed etc. All these anthropogenic activities are part of a survival race of humans with the aquatic life. In this competition, we as conservationists are bound to ponder about the conservation of the river along with the species like Ganges dolphins.

Why conservation of this particular species? Ganges



Photo credit: Udayan Borthakur



Photo credit: Sunny Deori

dolphin is considered as an “Umbrella species” whose conservation can be a holistic approach towards the preservation of the entire trophic levels in the food chain along with the river system. And of course a healthy river system will be a boon for entire human communities.

Among communities dependent on the Kulsi River, the cultivators' population is the highest followed by the fishermen communities. The livelihood of the fishermen of Kulsi is totally dependent on the amount of catch they get. As the competition for resource extraction is increasing, fish population is decreasing. Hence, fishermen are improvising their fishing gears from traditional methods towards monofilament gillnets, hooklines, etc. Apart from this the fishing communities are also involved in illegal activities such as fishing in 'fish ban' seasons and using mosquito nets for fishing. Such activities are further deteriorating the dolphin habitat. Also the younger generations of these communities are diverting themselves towards sand mining which earn a better profit in comparison to fishing. The newly adopted method of sand mining with fuel or electric pumps is disturbing the river bed stratum which serves as spawning grounds for the primary trophic levels of the river system, the planktons.

However, when we consider the socio-economic status of these people, it is found that they belong to a very low income group. The education qualifications of these people are also a reflection of their economic status. The younger generations are either following their elder generations' occupation or moving towards other options such as sand mining or working in cultivated land as landless labourers. They are deprived of basic needs such as proper health and education facilities, communications, etc. The neo liberal economic policies accepted by our government are not embracing the needs of our proletariat. Absence of alternative livelihood

source of income among the fishing communities and the sand miners have left them with no options other than to exploit the natural resources even more. Unemployment among the youths of the villages is spreading like cancer. Even worse, the villages of the downstream part of Kulsi River are affected by annual floods for almost for 6 months during a year.

Coming to the question towards the Conservation 'of what?'. On one hand we have the charismatic species of Gangetic Dolphins and on the other entire human communities along with their age old cultures associated with the river. This situation reflects the universal scenario as well when we consider the global distribution of Ganges dolphins in the Brahmaputra- Barak- Ganges in India, Meghna in Bangladesh and Karnaphuli in Nepal and the people residing in these valleys. Prior to conservation of the species, conservation of the people dependent on the river should be one of the major steps. Providing them with alternative livelihood sources is the need of the hour. The second step will be to provide them ownership by including them as stakeholders in conservation of the ecosystem strategies. And to achieve these, we as conservationist will require a strong shield of authentic scientific findings ready in hand to prove ourselves that conservation of the species and the people will help bring balance in the ecosystem. Failing to do this would bring us a tragic end of the great diversity of dynamic Brahmaputra valley.

The author is currently associated with the Wildlife Institute of India as a Project Fellow. She is also pursuing PhD from Forest Research Institute University in Ganges Dolphin ecology and threats. Her interest of work is Landscape ecology.  
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Photo credit: Masfique A. Hazarika

# Climate Change and its impact; a case study of Dihiri village in Dhemaji district

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Masfique A. Hazarika

What is climate change? Though the answer seems obvious, there is no exact definition of climate change. According to scientists, it's a long term phenomenon where various climatic factors like temperature and precipitation are changing in terms of quantity and quality over a period of time. Climate change has been defined by the United Nations Framework Convention on Climate Change (UNFCCC) as *"a change of climate which is attributed directly or indirectly to human activity that alters the composition of global atmosphere and which is in addition to natural climate variability observed over comparable time periods."* As suggested by many climatologists, it would be good if we can study the impact of climate change on a regional basis.

Brahmaputra is one of the largest rivers flowing through Assam, a state rich in bio-diversity due to its river system. This river starts its journey from a glacier at Tibet (on eastern Himalayan basin) and meets Bay of Bengal passing through Tibet, China (known as Warloong-Tsangpo), India and Bangladesh (known as Jamuna). While entering Assam from Arunachal Pradesh, Siang meets Dibang and Lohit, which are the two major river channels flowing from the north-east and eastern parts of the region. At this point, the river become huge and flow placidly westward in multiple braided channel. During its journey through Assam, the Brahmaputra has more than 10 tributaries which feed the river with huge amounts of water thus making the river system one of the largest throughout the planet. Most of its tributaries which carry huge amount of water flows

from the northern side and are concentrated in the district of Dhemaji, Lakhimpur and Sonitpur.

DihiriChapori is a village situated near the bank of Jiadhalriver (Samarajan branch) on the western part of Dhemaji district of Assam. The village is approximately 500 meter away from the NH 15. There are more than 500 households with a population of nearly 2,500. This whole village has been divided in two parts by the Samarajan branch of Jiadhal River. According to the villagers, there are a total of 6 settlements namely NamoniDihiri, MaajDihiri, UjoniDihiri, DihiriChapori, DihiriKachari and DihiriLapong. 3 settlements are located in between 2 branches of Jiadhal River (Kumotia and Samarajan).

These villages has been considered as one of the most vulnerable villages of western Dhemaji district in terms of flash flood. The flow regime of the Jiadhal river along with erratic rainfall on the upper catchment area (Arunachal Pradesh) has worsened the situation of Dihiri since 2007-08.

According to villagers, flash flood carries huge amount of silts and sediments which affect their agricultural field and their major source of livelihood. Since 2008-09 many researchers and a few renowned scientists have been visiting this village to carry out ground level research to understand the adverse effect of climate change, take adaptive measures for villagers against these adverse situations, etc.

Dihiri has found a place on various international research platforms. As told by the villagers, in the past, the socio-economic status of the villagers was better than at present. Agriculture productivity which used to be their major source of income has been most affected due to huge sandcasting deposited by the flood waters. They also noticed that the reason behind this sand deposition is cutting of trees on the hills of Arunachal Pradesh i.e. upper catchment of the river.

### **Impact on the Education system:**

The entire Dihiri Chapori has only two higher primary schools. One of them is located at NamoniDihiri and another at DihiriLapong. Since the last 10 years, the school situated at NamoniDihiri is washed away every year, by flash floods of Jiadhal. The villagers reconstruct the building after every flood season.

According to the only teacher of the school, he has to divide the timeline of 6 hours for class 1 to class 5 every day. Hence, the quality of teaching is degradingsteadily. Another Lower Primary school located at DihiriLapong which is a concrete building, but is not reachable for at least 4 months during the year due to flash floods. This



Photo credit: Masfique A. Hazarika

school building is also used as a shelter for villagers as well as other livestock during flood times and hence classes remain cancelled for long periods.

Moreover, teachers of both the schools are not from this village. They have to walk approximately 1 -2 km from the National Highway to reach the schools. During flood season the teachers cancel classes as they can't reach the schools due to flood. This leads to a weak educational foundation for all the children of this village. In regard to the socio-economic status, 90% of the households are BPL (Below Poverty Line) card holders. Those who are economically well-off, send their children to the nearby town for studies. However, those students are also affected during flood times when all connectivity to the main Highway gets damaged.

Researchers have tried to establish the fact that the situation of Dihiri is a good example of the adverse effect of climate change. With this article we would like to motivate and encourage local residents to enhance their knowledge based on climate change and its adverse effect on their livelihood. As defined above, climate change over eastern Brahmaputra basin is mainly due to the anthropogenic activity, i.e. deforestation in a huge scale.

The author started his career as a Research Assistant in Aaranyak. With an interdisciplinary background, he is presently working with Population Council, as a Field Coordinator in North East India.

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# Shifting from Human-Wildlife conflict to Co-existence

A successful elephant conservation project in Subankhata

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Dora Godinho

What does it take to mitigate and eradicate human-wildlife conflicts sustainably?

Each region and each type of conflict is a unique case but all conservationists would agree that we cannot resolve human-wildlife conflicts without a holistic approach. Such approach includes education and awareness, habitat restoration activities, capacity building and mobilization of different stakeholders and most importantly - empowerment and active participation of local communities.

In Northeast India, conflicts between people and elephants has become more frequent over the last decades due to a number of reasons, in particular encroachment, human settlements and land conversion for agricultural production and grazing in elephant corridors. All of which occurs in a context where human population increases, the resources shrink and the global climate changes.

Habitat loss and fragmentation have devastating consequences for elephants as they are compelled to penetrate human habited areas in search of food, hence destroying plantations, crops and properties

which amplify the conflicts with people and retaliatory killing.

Without intervention, these conflicts will increase and consequently, many human lives will be destroyed and elephant population will continue to decrease leading towards eventual extinction. In fact, Asian elephant population has been in permanent decline and these charismatic animals are today threatened with extinction.

But we cannot let that happen and this is where conservationists can intervene to help protect both elephants and local communities in the long run by orchestrating and developing win-win situations and direct benefits for both parties.

Much progress has been made in research, and today we are able to better understand the movements, behaviors and habitat uses of elephants. Such data collection is critical and is also the first step of conservation action

A few years ago, an innovative elephant conservation project was initiated in Subankhata, in ChirangRipu Elephant Reserve in the eastern part of Manas National Park. This region had witnessed several tragic incidents which resulted in the loss of human lives

and the subsequent retaliatory elephant killing.

The overall goal of the project was the long term protection and the survival of the Asian elephant in the Reserve, through encouragement and strengthening the capacity of local grassroots level NGOs and local communities in the restoration of degraded habitat, mitigation of Human Elephant Conflict (HEC) and support of alternative livelihoods.

The major challenge in this project was undoubtedly the involvement of the villagers in conservation, helping them to understand the direct link between conservation and the development of their communities from which they can highly benefit. But this can only happen through capacity building and immediate attainment of direct benefits. One of these benefits was the installation of a 14 km community based electric fencing which protects the villagers, their properties and crops from elephant intrusion. The installation of the electric fence appears to be very effective in keeping the elephants away. Since then, no major incidents were reported and the villagers are now sleeping safely





The author with Namita Brahma of Aaranyak and a SHG member from Subankhata

and peacefully.

The electric fences are well managed by the members of the community. Thanks to the creation of eight Village Anti-depredation Committee (VAC) which have been formed among the 6 most affected villages and equipped with torch lights, temporary watch towers and 10 mobile for communication, HEC can be further monitored and mitigated.

In total, more than 200 families diversified their livelihood to sustainable activities such as mushroom farming, beekeeping, piggery, embroidery, handloom and handicrafts for forest dependent women among other socio-economic schemes. All are direct benefits from conservation which help reduce their dependency on forests and make them self-dependent to solve their issues at their community level. These activities are expected to boost up much needed and lasting contribution to biodiversity conservation in the project site. To support this objective, several educational and awareness events have been carried out such as "Haati Mere Sathi Campaign", Observation of Elephant Day,

Celebration of World Environment Day, Summer school programme, Awareness and exhibition during the local festive time and a couple of awareness campaign on the issues of human elephant conflict.

The most important action to reduce pressure on the natural resources of the remaining forest patches was the creation of a 5000 sq. m community nursery for raising seedlings, with a purpose of reforestation in the nearby degraded forest. A total of 120,000 organic saplings of locally available tree species were raised in the nursery and planted successfully in 4ha of degraded land (out of which 1 ha of land is bordered with electric fencing) by students, villagers and other stakeholders. The survival rate is almost 80%.

Dora Godinho is a Portuguese national. With a background in specialized education, she moved to Switzerland where she worked for several events and communication agencies. Her passion for nature led her to obtain a diploma as "Sustainable Development Consultant" in 2011 by the WWF Training Center, Switzerland. She co-founded Geoimpulse, an association aimed at promoting renewable energies and worked as a freelance for both the private sector and NGOs including Greenpeace before joining IUCN in 2013. Dora was in charge of partnerships and donor relations for IUCN's SOS – Save Our Species programme. She loves travelling to India, Yoga and meditation and recently volunteered with Aaranyak.

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The passionate volunteers of the local NGO - ManasChowki Ecotourism Society (MSKETS) contributed immensely to this project. They participated in most of the project activities and resolved to play a key role in ensuring the durability of such activities. In order to encourage the community based resource pool for a long term HEC management and to strengthen the capacity of MKSETS, a floriculture nursery and an ecotourism initiative was also developed.

These project components complement each other to provide a holistic approach and help generate a positive shift in people's behaviors and attitudes towards elephants and conservation.

This project had a huge impact in reducing HEC in the targeted area and is expected to leave a permanent legacy by leaving in place a long term framework and a model to reduce the levels of human elephant conflict. It also demonstrates how much we can achieve when we work hand in hand, at all levels of the society, towards a better future - one where people and wildlife can thrive and coexist.

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**Note:** This project was funded by the Asian Elephant Conservation Fund of US FISH & WILDLIFE SERVICE



# Importance of Bird Conservation in non-protected areas

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Rehan Ali

Non-birders always wonder why bird conservation is necessary, what are its benefits as a whole and the difference it makes in human habitat. As nature lovers, avid birders and bird watchers have known through their work, bird and wildlife conservation is of prime importance to ensure richness and diversity of the earth.

It is the responsibility of nature lovers to share their knowledge, their thoughts and their experience to make everyone aware of the needs of conservation in all aspects of flora and fauna. We all have to understand the importance of bird conservation through different studies, field work, books, and most importantly the valuable guidance we gather from various respected persons in the field of Conservation and Nature.

In Assam, there are 5 National Parks and 18 Wildlife Sanctuaries, besides there are other areas in the region which can be promoted for studies and research as bird habitats. The water bodies termed as *Beels* are suitable bird habitats. You can find such *beels*, *marshy lands* in an around the National Highways, villages and even amidst the town areas where one can spot different species of birds.

Unfortunately, these areas and the bird habitat are now on verge of extinction, because the areas are not protected by any means, various human activities can be noticed in those areas such as fishing, games etc. These non-protected areas have a future only if a proper and planned infrastructure is designed for its conservation. Some of the other common factors that affect the bird habitat in those non protected areas are habitat loss through development, hunting, poaching and egg collecting, toxic poisoning, lack of individual adaptability and lack of awareness among neighbourhood communities.

There are some steps that any birder can take to promote bird conservation locally:

**Practice good ethics:** By being an ethical birder, you promote the viability of the hobby and



ensure that others will be able to enjoy it and develop their own awareness of the importance of bird conservation.

**Join conservation organizations:** There are dozens of bird and wildlife conservation and protection organizations that are supported by knowledgeable members. These organizations are often responsible for bird research, rehabilitation and other critical conservation initiatives.

**Participate in conservation programs:** You don't have to be a member of a formal organization to support bird conservation. Smaller programs such as adopting or donating to local aviaries can be helpful. Other environmental conservation programs, such as municipal recycling programs, also have indirect positive impacts on bird conservation.

**Be Aware of Issues:** Knowledgeable birders can have the strongest, most effective impact on conservation efforts. Stay informed about your local wildlife issues and other bird-related information, such as wetland development projects, land management issues or pollution cleanup initiatives.

**Share Birding With Others:** Sharing your love of Birding is one of the best ways to spread awareness about bird conservation. As more people join this popular hobby, the voice of concerned birders will grow to more, recognized and acted upon.

**Protect Diverse Bird Habitat:** It is a myth that birding is possible only in protected areas, birding must start from the backyard of your house. With zeal and efficiency birders can lend great support to the overall conservation efforts.

Understanding bird conservation means understanding ecology. Wild birds are an integral part of the ecosystem and serve many important purposes, including insect and rodent population control, distribution of seeds that leads to forest conservation and food sources for bird predators. One of the simplest pleasures we get from bird and wildlife conservation is a genuine appreciation for our natural world. By participating in different programs and working to save unique species and habitats, we come into close contact with different birds and can discover their unique personalities and quirks. Even the common birds in our backyard can teach us appreciation of natural diversity. By recognizing birds as unique and individual creatures, we can better understand the need for appropriate conservation efforts.

The author has been born and brought up in Kaziranga. He is presently working as a naturalist, travelling to important birding spots in the North East India. His main interests are birding and nature conservation.

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# My experiences at Hands on Genetic Population Estimation Training by Aaranyak

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Wildlife science has always been my ruling passion and working in RoyalManas National Park (RMNP) has helped me in reconnecting with my passion for wildlife studies. The national park has made great strides in the wildlife research field over the years. The use of cutting edge scientific tools such as camera trapping method in recent years has generated significant understanding of the ecology wildlife species in RMNP. However, as more advanced tools and resources such as wildlife genetics are available today to better comprehend the in depth ecology of wildlife and the life history traits of target carnivore species, it is now crucial to upscale research in the field of wildlife genetics.

Wildlife genetics have become a paramount tool in wildlife research and conservation and has opened up horizons into species, which are difficult to study effectively especially those that are occurring at lower density and are ambiguous in its physical features. Such non-invasive techniques are increasingly used in complementary with other methods such as the camera trap and radio telemetry methods in better comprehending the ecology of wildlife. Having forged ahead in wildlife research field through the use of cutting edge wildlife scientific tools such as photographic capture mark recapture technique principally in studying big cat species like tigers and leopards which can be discreetly distinguished through its coat pattern, our department of forest and park services has now embarked into extending the frontiers of knowledge on other keystone and lesser-known species.

One such study, which shall create yet another milestone in the country's conservation field, is the first ever-national elephant survey. The survey methodology for the national elephant count is the genetic capture mark recapture technique and camera trapping method. For the purpose of familiarization on the survey techniques, a hands-on training on the scat and DNA analysis for the field staff was prerequisite to explore and underpin knowledge in the field of wildlife genetics.

A capacity building training on the genetic population techniques for 13 participants organized by Aaranyak has given the much-needed impetus to us for preparing the ground for the upcoming national elephant survey in Bhutan. The comprehensive 7-day training involved systematic approach involved in the genetic analysis from dung sample collection from the field to DNA extraction in generating genotype profile in a

capture recapture framework. The emphasis on the need for proper designs for appropriate sampling strategy and genetic lab analysis strategy, which shall determine the success of the survey result, was highlighted during the training. From the basic principle of the need for closure in the population model, defining clear sampling occasions and obtaining high recaptures in the genetic CR analysis to proper field sampling methodology of collection of well performing samples for the lab analysis and minimizing contamination in reducing genotyping error during the lab process are important parameters in the systematic approach of estimating population abundance. The detailed theory cum hands on training was instructive and holistic and an empowering experience for all us. Through the training, we plan to impart training to our field colleagues on the survey methodologies.

We remain grateful to Aaranyak and in particular the resource persons, Udayan Borthakur and Pranjal Kumar Das for delivering a great training and also for their unstinting cooperation and support rendered throughout the training duration. Aaranyak has been the closest alliance of Royal Manas National Park, from India in supporting for the common cause of conserving wildlife across TraMCA landscape and we hope the association between Aaranyak and RMNP shall be reinforced every year through our common interests of conserving wildlife and their habitats.

## **Singye Wangmo**

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PHOTO ESSAY

# Pobitora Wildlife Sanctuary

Text: Udayan Borthakur

Images: Ashok Das

Pobitora, a 38.81 sq km Wildlife Sanctuary in the Morigaon district of Assam and at 1 hour drive away from Guwahati metro, holds the crown for the highest density of greater one-horned rhinos in the world. Rhino is the flagship species for Pobitora, a species that has become the mascot for the state of Assam and also a lifelong conservation agenda for Aaranyak. While Pobitora is known for rhinos, the place is also an abode for a variety of wildlife, especially its extremely rich birdlife, making it truly a great destination for any nature lover around. In fact, it is the diversity of avifauna alone, that annually attracts lot of tourists and wildlife photographers to Pobitora.

This photo essay presents some of the key wildlife attractions of Pobitora, captured by Mr. Ashok Das, who is serving the wildlife sanctuary as a Range Officer of the Department of Environment and Forests, Govt. of Assam. Mr. Das is an avid wildlife photographer, who has been photographing the wildlife wonders of Pobitora for past few years and his images have already won several national and international accolades.

**Mating of greater one-horned rhino**  
*Rhinoceros unicornis*  
IUCN Status: Vulnerable



**Greater one-horned rhino calf feeding**  
*Rhinoceros unicornis*  
IUCN Status: Vulnerable



**Calf of greater one-horned rhino**  
*Rhinoceros unicornis*  
IUCN Status: Vulnerable





## Grey-headed Fish Eagle,

a resident bird of prey in Pobitora

Scientific Name: *Ichthyophaga ichthyaetus*

IUCN Status: Near Threatened

Photo credit: Ashok Das

Occurring across the South and South East Asia, the species has small population sizes and only locally common. Habitat degradation, pollution and over-fishing is leading to its population decline.





**A feral Asiatic water buffalo**  
*Bubalus arnee*  
IUCN status: Endangered



**Baikal Teal, a winter visitor to Pobitora**  
*Sibirionetta formosa*  
IUCN Status: Least Concern



**Bean Goose, a rare winter visitor to Pobitora**  
*Anser fabalis*  
IUCN Status: Least Concern



**Pied Avocet, a winter visitor to Pobitora**  
*Recurvirostra avosetta*  
IUCN Status: Least Concern



**Wood Sandpiper**  
*Tringalareola*  
IUCN Status: Least Concern





Photo credit: Udayan Borthakur

# আর্দ্রভূমিৰ গুৰুত্ব, অস্তিত্বৰ সংকট আৰু সংৰক্ষণৰ প্ৰয়োজনীয়তা

ধ্ৰুৱজ্যোতি কলিতা

অসমত সৰু-বৰ অনেক আর্দ্রভূমি বা খাল-বিল, পিতনি, জান-জুৰি আছে। এই আর্দ্রভূমিবোৰ সবাতোকৈ চহকী, উৎপাদনক্ষম আৰু দীৰ্ঘম্যাদী পুনৰ ব্যৱহাৰযোগ্য প্ৰাকৃতিক ভাণ্ডাৰ। সেয়েহে আর্দ্রভূমিবোৰক আমাৰ ৰক্ষা কৰাচ বুলি আখ্যা দিব পাৰোঁ। কিন্তু অসমত প্ৰকৃতিৰ মহামূল্যবান সৃষ্টি আর্দ্রভূমিবোৰ জধে-মধে ব্যৱহাৰ কৰি থকা হৈছে। ইয়াৰ পৰা এইটোকেই বুজিব পাৰি যে ইয়াৰ গুৰুত্বৰ বিষয়ে অসমৰ ৰাইজ বৰ বেছি সজাগ নহয়। আর্দ্রভূমিৰ অপব্যৱহাৰ বা সংকোচন যদি আমি ৰোধ কৰিব নোৱাৰোঁ, তেনেহ'লে আমাৰ ভৱিষ্যৎ বংশধৰসকল ভয়াৱহ দুৰ্যোগৰ গ্ৰাসত পৰিব। সেয়েহে, আমি অসমৰ খাল-বিল, পিতনি, জান-জুৰিকে ধৰি সকলো ধৰণৰ আর্দ্রভূমিৰ গুৰুত্ব সম্পৰ্কে জনসাধাৰণক সচেতন কৰাৰ লগতে সংৰক্ষণৰ বাবে ঐক্যবদ্ধ হৈ কাম কৰিব লাগিব।

অসমৰ জলাশয়বোৰৰ গুৰুত্ব নিম্নলিখিত ধৰণে ব্যাখ্যা কৰিব পাৰি—

**জল সংৰক্ষণৰ বাবে জলাহভূমি :** এটা অঞ্চলত পৰা বৰষুণৰ বহুখিনি পানী ওচৰৰ খাল-বিল বা পিতনিত জমা হয়। তাৰ পৰাই পানী নিগৰি গৈ ভূ-গৰ্ভত জমা হয়। নলীনাৰ বা কুঁৱাৰ জৰিয়তে উঠোৰ ভূ-গৰ্ভৰ পানীখিনিৰ স্থান এনেদৰেই পুনৰ পানীৰে ভৰ্তি হয়। খাল-বিলৰ পানীয়ে ওচৰৰ মাটিও জীপাল কৰি ৰাখে।

**পুষ্টিৰ খাদ্যৰ উৎস :** আর্দ্রভূমিবোৰ মানুহৰ এবিধ প্ৰিয় খাদ্য মাছৰ আদৰ্শ প্ৰাকৃতিক উৎস। শেলুৱৈ, পানী শিঙৰী, মকুৱা আদিৰ দৰে জলজ উদ্ভিদো জলাশয়বোৰত প্ৰচুৰ পৰিমাণে পোৱা যায়। আর্দ্রভূমিৰ বিনাশ ঘটিলে আমি বহুতো সু-স্বাদু আৰু পুষ্টিৰ খাদ্য হেৰুৱাম।

**গ্ৰাম্য অৰ্থনীতিৰ শক্তিশালী ভেটি :**  
নল, খাগৰি, পাটি দৈ আদিৰে দৈনন্দিন জীৱনৰ বাবে লাগতিয়াল বহুতো সামগ্ৰী প্ৰস্তুত কৰাৰ উপৰিও সৌন্দৰ্যবৰ্ধক সামগ্ৰীও তৈয়াৰ কৰা হয়। এনে ব্যৱসায়ে বহুলোকক নিয়মীয়াকৈ অৰ্থ উপাৰ্জনৰ পথ দি আছে। আৰ্দ্ৰভূমিবোৰৰ বিলুপ্তি ঘটা মানেই এইসকল লোকৰ জীৱিকাৰ পথ বন্ধ হোৱা।

**বন্যপ্ৰাণীৰ অস্তিত্ব :** জলাশয়ক নিৰ্ভৰ কৰি এটা এলেকাত ভেকুলী, সাপ, নেউল, পখিলা, ডাউক, শৰালি, চিলনী, মাছৰোকা, হাড়গিলা, পানীকাউৰী আদি বিভিন্ন প্ৰজাতিৰ পোক-পতংগ, পশু-পক্ষী আৰু সৰীসৃপ জীয়াই থাকে। একেদৰে গা-ধুবলৈ, জলক্ৰীড়া কৰিবলৈ আৰু পানী পিবলৈ বন্যপ্ৰাণীবোৰে জলাশয়বোৰকেই ব্যৱহাৰ কৰে। গতিকে বিল, পিতনি আদি কমি অহা বা নিঃচিহ্ন হোৱা মানে এটা অঞ্চলৰ জীৱজগতৰ অস্তিত্বলৈও ভাবুকি অহা।

**সাংস্কৃতিক সমল :** বাৰে-বহণীয়া লোক-সংস্কৃতিৰ লগতো আৰ্দ্ৰভূমিৰ ওতঃপ্ৰোত সম্পৰ্ক। সকলো জনগোষ্ঠীৰেই গীত-মাতত জলাহভূমিৰ প্ৰাণী আৰু উদ্ভিদৰ উল্লেখ আছে। কিন্তু জলাহভূমিবোৰ বিনাশ হোৱাৰ লগে লগে যিহেতু, তাত থকা প্ৰাণী আৰু উদ্ভিদৰো বিনাশ ঘটিব, গতিকে ভৱিষ্যৎ প্ৰজন্মৰ বাবে প্ৰকৃতিৰ সেই বিচিত্ৰ সম্পদবোৰো অচিনাকি হৈ পৰিব। এনেদৰে থলুৱা লোক-সংস্কৃতিও ভৱিষ্যৎ প্ৰজন্মৰ বাবে আচহুৱা হ'ব।

**মাছৰ বংশ বৃদ্ধিৰ বাবে আদৰ্শ স্থলী :**  
নদীৰ লগত সংযোগ হৈ থকা জলাশয়বোৰ নদীত থকা মাছৰ বাবে কণী দিয়াৰ উৎকৃষ্ট ঠাই। বিলত জন্ম পোৱা মাছৰ পোণাবোৰ ডাঙৰ হোৱাৰ পিছত নদীলৈ ওলাই যায়। এনেদৰেই নদীসমূহত মাছৰ প্ৰাচুৰ্য অটুট থকাৰ লগতে বিভিন্ন এলেকালৈ মাছৰ বিস্তাৰ ঘটে। আৰ্দ্ৰভূমিবোৰ নষ্ট হ'লে বা নদীৰ লগত থকা সংযোগবোৰ বন্ধ হ'লে মাছৰ প্ৰাকৃতিক বংশবৃদ্ধি প্ৰক্ৰিয়াও বাধাপ্ৰাপ্ত হয়।

**পৰ্যটন আৰু শিক্ষাৰ থলী :** একোখন বিলত কিছুমান চৰাই নিয়মীয়াকৈ বাস কৰাৰ উপৰিও শীতকালত বিলবোৰলৈ বিভিন্ন ধৰণৰ দেশী-বিদেশী পক্ষীৰ আগমন ঘটে। প্ৰকৃতি অধ্যয়নৰ উপৰিও সৌন্দৰ্যৰ বাবে এনে জলাশয়বোৰ গৱেষক ছাত্ৰ-ছাত্ৰী তথা প্ৰকৃতিৰ আকৰ্ষণৰ কেন্দ্ৰ বিন্দু। এনেদৰে আৰ্দ্ৰভূমিয়ে এলেকাটোৰ অৰ্থনীতি আৰু শিক্ষাৰ বিকাশত সহায় কৰে।

**স্বাস্থ্যকৰ জলবায়ু :** পৰিষ্কাৰ পানীৰ হৃদ বা বিলে পাৰৰ বায়ু নিৰ্মল আৰু শীতল হৈ থকাত সহায় কৰে। ওচৰৰ বাসিন্দাসকলৰ বাবে নিৰ্মল পানীৰ বিল বা হৃদবোৰ আশীৰ্বাদ স্বৰূপ।

এইখিনি আলোচনাৰ পৰা এইটো কথা স্পষ্ট যে এটা অঞ্চলৰ সুস্থ প্ৰাকৃতিক পৰিৱেশ তথা মানুহৰ শাৰীৰিক, মানসিক, সাংস্কৃতিক তথা অৰ্থনৈতিক দিশ শক্তিশালী কৰি ৰখাত আৰ্দ্ৰভূমিৰ গুৰুত্ব অসীম। পিছে



এই কথাটো আমাৰ বহুতে ভালদৰে বুজি নোপোৱা বাবেই চৌপাশৰ জলাশয়বোৰ দ্ৰুত গতিত নিঃশেষ হ'বলৈ ধৰিছে। ই এক ভয়াৱহ বিপদৰ আগজাননী।

জলাশয়বোৰৰ আয়তন আৰু গভীৰতাও বিভিন্ন কাৰণত কমি আহিবলৈ ধৰিছে। তেনে কেইটামান কাৰণ তলত উল্লেখ কৰা হ'ল—

## জলাশয়ৰ আয়তন আৰু গভীৰতা হ্রাস পোৱাৰ কাৰণ

**ঘৰ-দুৱাৰ নিৰ্মাণৰ বাবে :** বিনামূলীয়া বা কম দামৰ মাটি বুলি বিবেচনা কৰি মানুহে জলাহবোৰ পুতি ঘৰ-দুৱাৰ সাজিবলৈ আৰম্ভ কৰিছে।

**খেতি-পথাৰৰ বোকামাটি, আৱৰ্জনাৰ বাবে :** সাধাৰণতে বাৰিষা হালবোৱাৰ সময়ত বহু পৰিমাণৰ বোকা মাটি উটি গৈ খেতি-পথাৰৰ কাষতে অৱস্থিত জলাহভূমিত



Photo credit: Dhruvajyoti Kalita



Photo credit: Udayan Borthakur

পৰেগৈ। পথাৰৰ কাষৰ জলাশয়বোৰৰ গভীৰতা দ্ৰুত গতিত হ্রাস পোৱাৰ এইটো এটা প্ৰধান কাৰণ।

**উদ্যোগৰ বাবে :** কিছুমান ব্যৱসায়ীয়ে উদ্যোগ নিৰ্মাণৰ বাবে, খাল-বিলবোৰ পুতি নিঃচিহ্ন কৰি গৈ আছে। আনহাতে, উদ্যোগৰ দ্বাৰা সৃষ্টি হোৱা কোলাহলে জলচৰ প্ৰাণীৰ আৰ্দ্ৰভূমিৰ ওপৰত নিৰ্ভৰশীল চৰাই-চিৰিকটি বা স্থানীয় বন্যপ্ৰাণীৰ চাল-চলনো বাধাপ্ৰাপ্ত কৰে।

**ৰাস্তা-ঘাট আদি নিৰ্মাণৰ বাবে :** জলাশয়ৰ গুৰুত্বক আওকাণ কৰি অপৰিকল্পিতভাৱে সজা খেলপথাৰ, ৰাস্তা, ৰাজহুৱা অনুষ্ঠান-প্ৰতিষ্ঠানবোৰে জলাশয়বোৰৰ প্ৰাকৃতিক অৱস্থা নষ্ট কৰিছে। বোঁৱতী পানীৰ সোঁত বা নদীৰ সৈতে থকা জলাশয়ৰ সংযোগ বাধাপ্ৰাপ্ত হ'লে সমগ্ৰ এলেকাটোৰ পৰিৱেশতন্ত্ৰতেই বিৰূপ প্ৰভাৱ পৰে।

**মানৱ বৰ্জিত আৱৰ্জনাৰ বাবে :** পাহাৰ বা অৰণ্যৰ পৰা ওলাই অহা জলাধাৰবোৰক বহুতে আৱৰ্জনা পেলোৱা ডাষ্টবিন হিচাপে ব্যৱহাৰ কৰে। এনেদৰে পেলোৱা আৱৰ্জনাৰ বাৰিষা নৰ্দমা আৰু জানবোৰেৰে গৈ ওচৰৰ খাল-বিলবোৰত পৰা বাবেই বহুতো জলাশয়ৰ আয়তন দ্ৰুত হাৰত হ্রাস পাই আহিছে। জলাশয়ৰ পানীও বিযাক্ত কৰি তুলিছে।

**বনাঞ্চল আৰু পাহাৰ ধ্বংস :** অসমৰ বহুকেইখন বিলৰ কাষতেই পাহাৰ আৰু অৰণ্য অৱস্থিত। আৰ্দ্ৰভূমিৰ ওচৰৰ পাহাৰত জধে-মধে চলোৱা খনন কাৰ্য আৰু অৰণ্যত ব্যাপক পৰিমাণে গছ-গছনি কটাৰ ফলত বাৰিষা বোকা মাটি আৰু আৱৰ্জনা উটি আহি জলাশয়বোৰৰ গভীৰতা হ্রাস কৰে।

## জলাশয় ধ্বংসই আনিব দুৰ্যোগ

আমাৰ চৌপাশৰ খাল-বিলৰ পানীত

কি ধৰণে বিযাক্ত দ্ৰব্য মিহলি হ'বলৈ ধৰিছে, আপুনি তলৰ কথাকেইটালৈ মন দিলেই অনুমান কৰিব পাৰিব—

**দৈনন্দিন জীৱনত ব্যৱহৃত ৰাসায়নিক পদাৰ্থ :** মানুহে সাধাৰণতে ব্যৱহাৰ কৰা ৰাসায়নিক সামগ্ৰীৰ অৱশিষ্ট বিশেষকৈ ৰাসায়নিক কীটনাশক, ৰং, সাৰ, যান-বাহনত ব্যৱহৃত পেট্ৰ'লিয়ামজাত সামগ্ৰী, বেটেৰী, মানুহ তথা পশু-পক্ষীৰ ক্ষেত্ৰত ব্যৱহৃত দৰৱৰ অৱশিষ্টৰ উপৰিও অপৰিশোধিত খালী বটল, পেকেট আদি য'তে-ত'তে পেলাই দিয়াৰ ফলত তাৰ বহুখিনি বৰষুণৰ পানীত উটি গৈ ওচৰৰ খাল-বিলৰ পানী বিযাক্ত কৰি তোলে।

**কল-কাৰখানাৰ পৰা পেলাই দিয়া বিযাক্ত দ্ৰব্য :** আজি-কালি সৰু-বৰ নগৰবোৰৰ উপৰিও গাঁওবোৰতো বিভিন্ন ধৰণৰ সামগ্ৰী উৎপাদন আৰু মেৰামতিৰ উদ্যোগ গঢ়ি উঠিছে। তেনে বহু উদ্যোগৰ

বৰ্জিত বিভিন্ন ধৰণৰ সামগ্ৰী বা ৰাসায়নিক দ্ৰব্যবোৰ পোনপটীয়াকৈ মুকলি ঠাই, জলাধাৰ আদিত পেলোৱা হয়। এনেবোৰ দ্ৰব্য জলজ উদ্ভিদ আৰু প্ৰাণী, দুয়োবিধৰ বাবেই ভাবুকি স্বৰূপ।

**খেতি-পথাৰত ব্যৱহৃত ৰাসায়নিক দ্ৰব্য :** আমি খেতি-পথাৰত ব্যৱহাৰ কৰা বিষাক্ত কীটনাশক, ৰাসায়নিক সাৰ, ৰাসায়নিক অপতৃণনাশক আদিৰ পথাৰত ৰৈ যোৱা অৱশিষ্টখিনিয়ে কাষৰ জলাশয়বোৰৰ পানী দূষিত কৰে। এইদৰে দূষিত হোৱা পানীয়ে উদ্ভিদ, মাছ, পতংগ, পশু-পক্ষী, সাপ-ভেকুলীৰ উপৰিও মানুহৰ দেহৰো ভয়ংকৰ অনিষ্ট কৰে। আনকি জলচৰ প্ৰাণীৰ কণীও নষ্ট কৰে। পানীৰ গুণাগুণ নষ্ট হোৱাৰ বাবে কিছুমান জলাশয়ত স্থানীয় প্ৰাকৃতিক পৰিৱেশৰ ভাৰসাম্যৰ প্ৰতি ভাবুকিৰ সৃষ্টি কৰা আচহুৱা অপতৃণৰো জন্ম হয়।

## জলাশয় নিঃচিহ্ন কৰাৰ ফলত দেখা দিব পৰা বিপৰ্যয়

- ভূজলৰ ভাঙাৰ দ্ৰুত গতিত হ্রাস পোৱা। পুৰণি কুঁৱা, দমকল আদিৰ তলি শুকাই যাব।
- প্ৰকৃতিৰ বুকুত থকা বিষাক্ত পদাৰ্থবোৰৰ পৰিমাণ ভূগৰ্ভৰ অধিক তললৈ বাঢ়ি গৈ থাকে। সেয়েহে যদি আমি অধিক তলৰ পৰা পানী তুলি আনিলে, পানীৰ সৈতে বিভিন্ন বিষাক্ত পদাৰ্থও আহে। ভূগৰ্ভৰ অধিক গভীৰতাৰ পৰা উঠোৱা পানীয়ে খেতিপথাৰৰ মাটিও বিষাক্ত কৰে।
- খলুৱা উদ্ভিদ আৰু প্ৰাণী অস্তিত্বৰ সংকটত পৰিব। ফলত এলেকাটোত জৈৱ বৈচিত্ৰ্যৰ প্ৰাচুৰ্য হ্রাস পাব। চৌপাশৰ খেতি-পথাৰৰ মাটিৰ উৰ্বৰতা হ্রাস পাব।
- গ্ৰামাঞ্চলৰ বৃহৎসংখ্যক লোকৰ জীৱিকাৰ পথ বন্ধ হোৱা।
- বনৰীয়া আৰু ঘৰচীয়া পশু-পক্ষীৰ বাবে খাদ্যৰ নাটনি হ'ব।
- সাংস্কৃতিক দিশত দুৰ্বল হোৱা।
- আমোদ-প্ৰমোদৰ বাবে নিৰ্মল জলাশয়ৰ অভাৱ হ'ব। সামগ্ৰিকভাৱে

এলেকাটোৰ জলবায়ুৰ ওপৰত বিৰূপ প্ৰভাৱ পৰিব।

- এলেকাটোলৈ পৰ্যটকৰ আগমন হ্রাস পাব।
- মাছৰ স্বাভাৱিক বৃদ্ধি বাধাপ্ৰাপ্ত হ'ব।
- এলেকাটোলৈ বিভিন্ন ঋতুত অহা চৰাইৰ সংখ্যা হ্রাস পোৱাৰ বাবে চৰাইয়ে নিয়ন্ত্ৰিত কৰি থকা ক্ষতিকৰ পতংগ বৃদ্ধি পাব।
- এলেকাটোত নতুন ধৰণৰ ৰোগ-ব্যাদিৰ প্ৰাদুৰ্ভাৱ ঘটিব।

## আৰ্দ্ৰভূমিৰ সুৰক্ষাৰ বাবে আমি ল'ব পৰা কিছুমান ব্যৱস্থা

- জলাশয়ৰ বুকুত মানুহৰ বসতি, নিৰ্মাণ কাৰ্য বা কৃষি কাৰ্য বন্ধ কৰা।
- ইতিমধ্যে আৱৰ্জনা পেলোৱা জলাশয়বোৰ আৱৰ্জনামুক্ত কৰা।
- জলাশয়ৰ পাৰত বা সংলগ্ন খেতি পথাৰৰ কাষত উদ্যোগ স্থাপন নিষিদ্ধ কৰা।
- বাহিৰৰ বিষাক্ত পদাৰ্থ নলা বা জলাশয়ত পৰাৰ আগতে শোধনৰ ব্যৱস্থা কৰা।
- খেতি-পথাৰৰ আৱৰ্জনা জলাশয়লৈ যাব নোৱাৰাকৈ ব্যৱস্থা গ্ৰহণ কৰা।
- জলাশয়ৰ অপতৃণবোৰ নিয়মীয়াকৈ আঁতৰোৱাৰ লগতে গভীৰতা বৃদ্ধিৰ বাবে বুকু খন্দা।
- নলা-নৰ্দমাৰত ঘৰুৱা বা ঔদ্যোগিক আৱৰ্জনা পেলাব নোৱাৰাকৈ কঠোৰ আইন প্ৰয়োগ কৰা।
- কৃষি পথাৰত জৈৱিক সাৰ, কীটনাশক আদিৰ ব্যৱহাৰ বৃদ্ধি কৰা।

- জলাশয়ৰ সম্পদ যাতে জধে-মধে ব্যৱহাৰ কৰিব নোৱাৰে তাৰ বাবে নীতি-নিয়ম বলবৎ কৰা।
- মাছৰ বৈচিত্ৰ্য ৰক্ষাৰ বাবে নদীৰ লগত পূৰ্বৰে পৰা থকা সংযোগবোৰ পুনৰ মুকলি কৰা।
- বৰষুণৰ পানীয়ে যাতে পাৰৰ ভূমি উটুৱাই নি জলাশয়বোৰৰ বুকুত পেলাব নোৱাৰে, তাৰ বাবে জলাশয়বোৰৰ চৌপাশে ডাঠ হাবি-বনৰ আবেষ্টিনী গঢ়ি তোলা।
- জলাশয়বোৰৰ একোটা অংশত নিৰ্ভেজাল প্ৰাকৃতিক পৰিবেশ অটুট ৰখাৰ বাবে মানুহৰ চলাচল নিষিদ্ধ কৰা উচিত।
- কণী দিয়া ঋতুত মাছ ধৰা বন্ধ ৰাখক। মাছ ধৰাৰ ক্ষেত্ৰত মীন আইন মানি চলক।
- মাছ ধৰাৰ বাবে পানীত বিষ বা বোমা নিদিব। এনে কাৰ্যই সৰু-বৰ সকলো মাছৰ লগতে অন্যান্য প্ৰাণীৰো মৃত্যু ঘটায়।

আহক, আমি আমাৰ মূল্যবান আৰ্দ্ৰভূমিবোৰ সংৰক্ষণৰ বাবে আগবাঢ়ো। প্ৰতিটো এলেকাৰ গাঁও পঞ্চায়ত, স্বেচ্ছাসেৱী সংগঠন, শিক্ষানুষ্ঠানে নিজ এলেকাৰ জলাশয়বোৰৰ সুৰক্ষাৰ বাবে সজাগতা অভিযান আৰম্ভ কৰো আহক, হাতে-কামে লাগো আহক। প্ৰয়োজন সাপেক্ষে স্থানীয়ভাৱে নীতি-নিয়ম বলবৎ কৰি আৰ্দ্ৰভূমিবোৰ সংৰক্ষিত হোৱাটো নিশ্চিত কৰক।

আমাৰ চহকী জৈৱ-বৈচিত্ৰ্য, অৰ্থনীতি আৰু সাংস্কৃতিক সুৰক্ষা দিবলৈ আমি জলাশয়বোৰ ৰক্ষা কৰিবই লাগিব।

নলবাৰী জিলাৰ টিছৰ কাউৰেহাগি (জলখানা) গাঁৱত জন্ম গ্ৰহণ কৰা ধ্ৰুৱজ্যোতি কলিতা আৰণ্যকৰ আজীৱন সদস্য হোৱাৰ উপৰিও প্ৰাৰম্ভিক স্তৰৰ পৰাই সংগঠনটোৰ লগত ওতপ্ৰোতভাৱে জড়িত। তেওঁ একেধাৰে এজন লেখক, কবি আৰু আলোকচিত্ৰ শিল্পী। এজন দায়িত্বশীল চৰকাৰী কৰ্মচাৰী হোৱাৰ উপৰিও তেখেত অসম বিজ্ঞান সমিতি, চি ই ইৰ দৰে সংগঠনৰ লগতো নিবিড়ভাৱে জড়িত।

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# Glimpses of Aaranyak's work in the past months

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## Hands on Training on Genetic Population Estimation

In a step towards promoting international collaboration in the field of wildlife genetic research, Wildlife Genetics Laboratory of Aaranyak at Guwahati organized a training on genetic population estimation of wildlife species for the Forest Department officials of Bhutan from 7th to 13th December 2015. The training covered various topics such as the basics of genetics markers, sampling strategy, DNA extraction and PCR technology, DNA finger printing and capture-recapture data analysis. Total of 13 officers from Bhutan participated in this training. It is worth mentioning that Wildlife Genetics Laboratory has been conducting genetic population monitoring of several threatened wildlife species in India, Bhutan and Indonesia for past several years. ■

## Promoting eco-tourism among youths at Laokhowa-Burhachapori WLS

The Laokhowa-Burhachapori Wildlife Sanctuary is lesser known among eco-tourists inspite of its pristine beauty. To promote Eco-tourism in the area, a capacity building training for the local youths and frontline staff of forest

department was successfully conducted at Burhachapori Wildlife Sanctuary on 25-27 December, 2015. Over 60 participants from the fringe area of Laokhowa-Burhachapori Complex had actively participated in the training which was jointly organized by Aaranyak, Nagaon Wildlife Division, WWF-India and Laokhowa-Burhachapori Conservation Society( LBCS). The training focused on building of eco-tourist guides, conservation educators from that locality and conservation of Greater one-horned rhino as well. ■

## Hoolock Gibbon Conservation Training Programme

Aaranyak has been consistently organizing a series of Hoolock Gibbon Conservation Training Programme for the Forest Guards of Assam. A wide range of topic areas was covered which included - Biodiversity in Northeast India and conservation, Primates Conservation in Northeast India with special reference to Hoolock gibbon, Gibbon Census or Population estimation, Gibbon Data collection, maintaining & reporting, Gibbon habitat characteristic and Restoration, Population and Habitat Monitoring, Global Positioning System & use in field, and Legal Orientation (Wildlife Laws and its application). ■

## Training for Asian Elephant Population Estimation

A much needed training on elephant census following indirect method was held for the staff of RipuChirang Elephant Reserve stretching from Haltugaon division to Udalguri division, by Aaranyak in collaboration with the Forest Department. The trainings were held in Jharbari range (Haltugaon), Bansbari Range (Manas National Park), Kumarikata Range (MushalpurDivn) and Nonoi Range (Udalguri) from 2nd to 12th February 2016. More than 240 forest staff along with members from 6 different NGOs took part in the training. The course provided basics on elephant census using dung count method followed by field practical sessions. ■

## Capacity Building Training at Khonoma, Nagaland

Locals of Khonoma village of Nagaland and Aaranyak have forged an alliance to facilitate a mutual cooperation to further conservation practices in Nagaland. A capacity building training was held at Khonoma village on 26-27 February, 2016. Khonoma has created for itself a unique identity in the conservation arena and has received global appreciation for its

community based conservation practices. The training was jointly organised by the Khonoma Nature Conservation and Tragopan Sanctuary (KNCTS) Trust and Aaranyak. Officials of KNCTS, representatives of Khonoma Students Union, local tourist guides, nature lovers as well as students had taken part in the training. ■

## Micro-enterprise development training to women SHGs of Golaghat

Encouraging communities to adopt sustainable livelihood methods that nurture the environment instead of exploiting them is one of Aaranyak's goals. With this vision, various trainings are organised at frequent intervals which involve grassroot communities living around protected areas. On 29th and 30th March, 2016, a Micro-enterprise development training, was provided to five woman self-help groups from Golaghat district. A total of 23 women participated in two days long training programme. Through this training programme a platform was provided for knowledge sharing and to give the SHGs orientation on various enterprises. ■

## Consultation on the Draft Wetland Rules 2016

Aaranyak and Action Aid jointly organised a consultation on the Draft Wetland Rules 2016, at Guwahati on June 2, 2016. The Ministry of Environment and Forest, Government of India has recently released the Draft Wetlands

## Accolades

### India Biodiversity Award 2016

Purnima Devi Barman who leads Aaranyak's Greater Adjutant Stork project and Dadara's all women Hargila army, have been conferred with the prestigious 'India Biodiversity Award 2016', by UNDP, Ministry of Environment, Forest and Climate change, National Biodiversity Authority India.

The Award was given in the 'Conservation of Threatened Species' category.

Purnima Devi Barman received the Award from Hon'ble Governor of Maharashtra Shri Chennamaneni Vidya Sagar Rao and Mr. Prakash Javedkar, Hon'ble Minister of Environment, Forest and Climate change on International Biodiversity Day, 22nd May 2016, at Yashwantrao Chavan Auditorium, Mumbai, Maharashtra.

### Heritage Heroes Award 2016

Dr. Bibhuti Lahkar, ecologist and Head, Elephant Research and Conservation Division, Aaranyak, has been nominated for **Heritage Heroes Award 2016** by IUCN, for his exemplary work at Manas landscape, Assam!

(Conservation and Management) Rules 2016. The objective of the consultation was to analyse the pros and cons of the proposed new wetland rules and assess how relevant they are especially from the point of view of Assam's wetlands as well as to recommend corrections, changes and inclusion of new ideas. Several recommendations were made during the consultation which was forwarded to the Ministry of Environment and Forest, Government of India. ■

## Indo-Bhutan meet discuss co-operation for conservation of TraMCA

In a joint initiative by Aaranyak and WWF, delegates representing the Governments of Bhutan and India along with conservation NGOs of the region met in Guwahati, Assam. The landmark meeting was held on 21st-22nd June 2016 to discuss Conservation of Biodiversity- Issues and Opportunities in the large Transboundary Landscape between

India and Bhutan. This meeting had the delegates taking stock of the status of implementation of the work plan developed for the region and also discussing about the emerging issues especially with reference to proposed developmental activities having potential negative impact on the forest resources. ■

## 100 hoardings spread awareness on Greater Adjutant Conservation!

In a remarkable achievement, Aaranyak's Greater Adjutant Stork Conservation program has been granted 100 hoardings by the Kamrup District Administration along Hajo Road. At present 15 hoardings which depict GAS conservation messages, have been put up, with the rest to follow very soon. Special hoardings with detailed legal information on GAS conservation has also been erected through the support of Legal Advocacy Division of Aaranyak.

## Essential items distributed among volunteers/staff working for conservation

In a bid to assist and encourage the exemplary work during the harsh winters, Aaranyak distributed warm jackets among casual staff members of Pobitora Wildlife Sanctuary on 17 December 2015. Aaranyak provided members of Village Defence Party in Baguri area, raincoats and field shoes in an event held at Baguri range of Kaziranga National Park on 18th June 2016. About 150 raincoats and shoes were provided to the VDP members. Held in association with the David Shepherd Wildlife Foundation of United Kingdom, the initiative supported the Kaziranga National Park authorities to provide the much needed items. As monsoon sets in, raincoats become an item of vital necessity for forest staff, working on the field. Aaranyak distributed 300 raincoats, in an effort to assist the Frontline staff of Kaziranga National Park, at an event held in Bagori, on 6th July 2016. The Assam State Zoo cum Botanical Garden has been recently struggling in many aspects which include timely availability of crucial field necessities. To provide some much needed relief to the staff, Aaranyak distributed 178 pairs of shoes and boots in an event held on 16th May 2016 at the Herbarium Meeting Hall, Assam State Zoo cum Botanical Garden, Guwahati. The shoes were sponsored by Aaranyak and Katie Adamson Conservation Fund (USA), in association with Assam State Zoo cum Botanical Garden. ■

## 'Asiyo haatir bidyalay yatra' an Initiative by Aaranyak

The 'Asiyo haatir bidyalay yatra' (Asian Elephants' journey to schools) initiative by Aaranyak is a crucial awareness campaign on elephant conservation which is presently being carried out in schools of Golaghat district. We target to reach fifty thousand school students through this initiative in one year. Almost 30 schools have been covered so far, under this initiative. ■

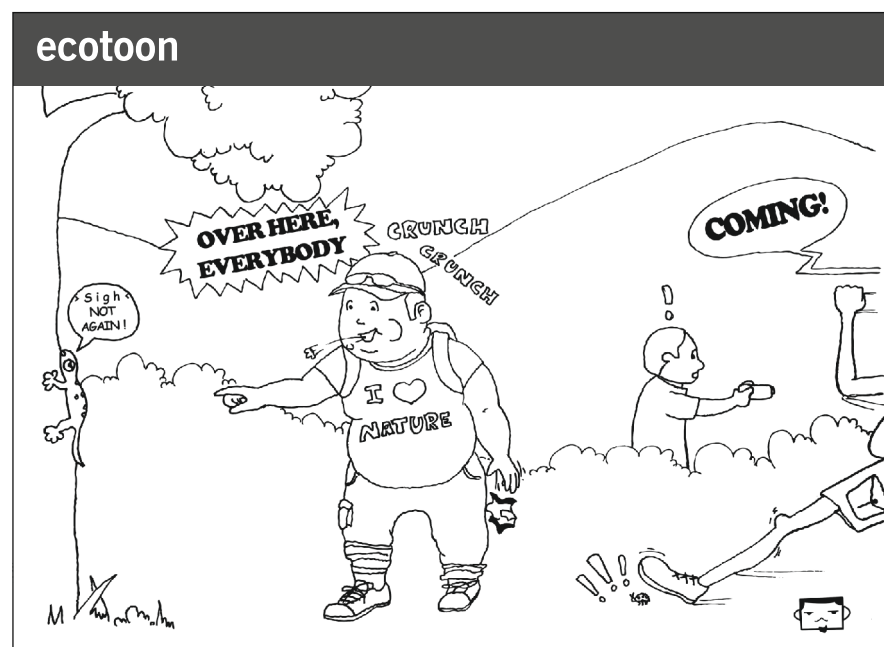
## Remote Sensing, GIS & GPS Application in various fields

The team of Geo-Spatial Technology Application Programme (GTAP) of Aaranyak has been consistently organising workshops on "Remote Sensing, GIS & GPS Application in various fields". The most recent training was held in the month of July 2016. Researchers and students from different universities

participated in this training programme which included both theory and practical sessions. ■

## New Species of Primate discovered in India

The White-cheeked Macaque (*Macaca leucogenys*) was discovered for the first time in India at Arunachal Pradesh, by a team of photographers and biologists! The team comprising of Aaranyak members Ranjan Kumar Das, Udayan Borthakur and Dilip Chetry made this incredible discovery. The group, accompanied by professional bird guide Binanda Hatibarua was on a birdwatching trip to the easternmost district of India in March 2015, when they had this sighting. On the basis of photographs of a group of macaque taken during the trip, it was confirmed to be the White-cheeked Macaque in 2016. The White-cheeked Macaque itself is a species new to science, first reported by Dr. Li Cheng and his group from the Modog in South-eastern Tibet in China in 2015.



# Kulada Kumar Bhattacharjee



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This issue of Nature Talk features the multifaceted **Kulada Kumar Bhattacharjee;** actor, director, advertising consultant, columnist and essayist on theatre and cinema.

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## **What do you feel are the most critical environmental concerns for Assam and rest of North-East India at present?**

Well, I feel that the issue for entire North-east India including Assam is cutting of trees, landslides and land slips. From the last one month, there has been continuous rainfall and landslides and they are now looking for the alternative. Basically, deforestation is the most critical environmental concern. Soil conservation and forest conservation are the most important issues in Assam. These two departments need to be more active and vigilant. Brahmaputra needs a lot of deep dredging. The fertile soil should be taken to the areas which need it. It also causes flood downstream in Bangladesh. Then there is also the problem of artificial flood in cities like Guwahati. Unless lots and lots of trees are planted on the hills, the people will continue to encroach on the spaces. People should be resettled in other areas.

## **Is it possible to balance conservation and development in the North-East?**

If we talk about industrial development, we must have such industries which are eco-friendly. As for other kinds of development, the resources in Assam



are natural ones. For human development, we have to use nature in such a manner that nature is regenerated. Now, for example the Jaintia people, they practice jhum cultivation (slash and burn). After exploiting the field to its full potential they plant new trees before leaving. Therefore there is regeneration. By the time they return again to the same plot it is ready for slashing and burning. The utilization of forest is exactly like that. Today it is called Social Forestry. A tree is like a human being. It has to die one day so you identify and allow licensed people to cut those trees. Tree saplings are to be planted and old trees cut away. We have another problem: the government has been giving more licenses than it should, for extra revenue. There is a film in Assamese, called, *Varshranya* which depicts the kind of destruction that takes place in forests.

There is a big protest over highway construction and construction of a hydro-electric project on the north bank. Cities need electricity. Hydro projects are high in cost but destructive. I made several films on this subject. Now if you have mini hydel projects, it's a loss. Soon the river dries out. The resources die out and so much land is completely lost for cultivation work. For example, the Bardikharu mini hydel station in Karbi Anglong. Assam is surrounded by mountains. Being a low lying area, any environmental destruction there directly has an instant impact on low land.

#### **What do you feel are the most important mediums to spread the message of conservation?**

To motivate people for conservation television is the most forceful medium. It has to continuously telecast interesting programmes on nature preservation. Other media such as the print is costly. Whereas for television, your investment is at the beginning and you start telecasting. Television is nowadays synonymous with private channels, people hardly watch government channels. So these channels should make interesting programs with nature as the core subject. It would be good if the young generation is very subtly encouraged to watch nature programs and they themselves come forward to work on it. The young generation has to be motivated not only by mass media but also by direct contact like face to face interaction. There was a time we used to gift saplings and that should be encouraged.

#### **What spurred your interest in nature and conservation and what motivated you to make the films "delightful**

#### **Nature" and "Pride of Nature" in 1972?**

I made quite a few nature films. During my childhood Guwahati was a small town so nature was everywhere, so we were used to that. I have written quite a few articles about it.

It is a coincidence that I was based in Kolkata, along with two others, we opened a documentary film production company. A senior journalist, advised me to begin with producing a film on the flora and fauna of Assam and the Northeast. That led me to make the twin films: *The Delightful Nature* and *The Pride of Nature*. That was the beginning of my involvement with nature. I made several films on preservation of nature.

#### **Would you like to share any incident that brought you closer to nature?**

I actually started making documentary films as a way of making money, but love for Nature was also there. I have always had a dream to live amid nature. All the villages have now changed. I would like to live in a village. It would be a compensation for being a city bred person. A while ago, I was on the verge of buying a piece of land in a village and live in a bamboo house. There would be ponds with fish and ducks and surrounded with no artificial borders but bamboo groves. I realized I did not have the required finance. So, that dream is yet to come true – and I am also getting ahead in age to live on my own. NGOs like Aaranyak should take children and young people to villages and hills and rivers. I made a film called 'Chhutir Eta Din' in which a boy and a girl are taken by their uncle, on a holiday, to nature.

#### **Any suggestions you would like to give Aaranyak?**

Aaranyak is doing excellent work for nature conservation. The organization has been working really hard since many decades. I suggest Aaranyak does campaigning for Deeporbeel, which is suffering because of all the construction and the railway line. I hope Aaranyak continues its work of planting trees in and around Guwahati and fight against illegal cutting of trees. And, one more suggestion for Aaranyak is to campaign for restoration of the beautiful park in Pan Bazaar, the erstwhile heritage site called, The Jubilee Garden which has been demolished by so-called 'Panitanky'!

Interviewed by Julia Nameirakpam

# অৰণ্য, কৃষি আৰু সংৰক্ষণ চিন্তা

অৰণ্য সংৰক্ষণৰ শেহতীয়া ধাৰালৈ লক্ষ্য কৰিলে দেখা যায় যে ক্ৰান্তীয় আৰু নিম্ন-উপাৰ্জনৰ দেশবোৰত সৰ্বাধিক বন ধ্বংস বা নিৰ্বনানিকৰণ হোৱাৰ বিপৰীতে কৃষিভূমিৰ পৰিমাণ বৃদ্ধি হৈছে। তাৎপৰ্যপূৰ্ণ যে পৃথিৱীত বছৰি সাত নিযুত হেক্টৰ বনাঞ্চল হেৰুৱাৰ বিপৰীতে প্ৰায় ছয় নিযুত হেক্টৰ কৃষিভূমি বৃদ্ধি পাই আহিছে। এনে এক প্ৰতিচ্ছবিৰ বাবেই হয়তো অৰণ্য আৰু কৃষিক দুটা পৃথক বা বিচ্ছিন্ন বিষয় হিচাপে গণ্য কৰি অহা হৈছে। বিশ্বত বৰ্তমানেও নিৰ্বনানিকৰণৰ অন্যতম কাৰকৰ ভিতৰত কৃষিয়ে প্ৰধান। বিশ্বৰ প্ৰায় ৮০ শতাংশ নিৰ্বনানিকৰণ কৃষিৰ ফলতেই সংঘটিত হৈছে।

বিশেষকৈ ক্ৰান্তীয় আৰু উপ-ক্ৰান্তীয় অঞ্চলত হোৱা অৰণ্য ধ্বংসৰ ৭৭ শতাংশ কৃষিৰ বাবেই হৈছে। ইয়াৰ ভিতৰত ব্যৱসায়িক ভিত্তিৰ কৃষি আৰু স্থানীয় লোকৰ জীৱনধাৰণৰ নিমিত্তে কৰা কৃষিকাৰ্যৰ বাবে ক্ৰমে ৪০ শতাংশ আৰু ৩৩ শতাংশ ব্যৱহৃত হৈছে। সেয়েহে এতিয়া মাটিৰ ব্যৱহাৰৰ (land use) এই সংঘাত, বিশেষকৈ কৃষি আৰু বনৰ ক্ষেত্ৰত, নিৰ্মূলৰ বাবে বিশ্বই চিন্তাচৰ্চা আৰম্ভ কৰিছে। এজেণ্ডা ২০৩০তো (The 2030 Agenda for Sustainable Development) এই ধৰণৰ সন্মিলিত প্ৰচেষ্টাৰ ওপৰত গুৰুত্ব দিয়া হৈছে। অলপতে ইটালীৰ ৰোমত অনুষ্ঠিত খাদ্য আৰু কৃষি সংস্থাৰ অধিবেশনত স্বাভাৱিকতে এই বিষয়ে গুৰুত্ব লাভ কৰে। তাত কোৱা হৈছে সঠিক ব্যৱস্থাপনাৰ জৰিয়তে অৰণ্য ধ্বংস নকৰাকৈ বা অৰণ্য বৃদ্ধি কৰিও কৃষিৰ উৎপাদন বৃদ্ধি আৰু খাদ্যৰ সুৰক্ষা সম্ভৱ। বিশ্বৰ ২০খন দেশে এই কাৰ্যসিদ্ধি কৰিছে বুলি অধিবেশনৰ তথ্যত প্ৰকাশ পাইছে। ই অৰণ্য বা পৰিবেশ সংৰক্ষণৰ সামগ্ৰিক প্ৰচেষ্টাক প্ৰভাৱিত যে কৰিব ধুকুপ। বন্যপ্ৰাণী-পৰিবেশ সংৰক্ষণ লগত জড়িত সংস্থা বা ব্যক্তিবোৰৰ এই দিশত যোগাত্মক চিন্তাচৰ্চাৰ প্ৰয়োজন আছে। অসম তথা ভাৰতত এতিয়াও পৰিবেশ-বন্যপ্ৰাণী সংৰক্ষণ কিছুমান নিৰ্দিষ্ট বেচৰকাৰী সংস্থা বা ব্যক্তি বিশেষৰহে বিষয় যেন বুলি সাধাৰণ ৰাইজে ভাবে। এয়া অনস্বীকাৰ্য যে বন-পৰিবেশ সংৰক্ষণত অৰণ্যৰ দাঁতিকাষৰীয়া অঞ্চলৰ স্থানীয় সাধাৰণ ৰাইজৰ অৱদানৰ ইতিহাস বহু পুৰণি। সেয়ে পৰিবেশ সংৰক্ষণৰ লগত সংযুক্ত সকলোৱে উল্লিখিত সাধাৰণ ৰাইজৰ জীৱন-জীৱিকাক জড়িত কৰি সংৰক্ষণৰ প্ৰচলিত ধাৰণাটো নতুন ধৰণে চিন্তা কৰিবৰ হ'ল।

আনহাতে, সম্প্ৰতি পৰিবেশ সংৰক্ষণৰ কাম-কাজবোৰ বহু সময়ত জনসাধাৰণৰ বাবে এক ধূসৰ প্ৰতিচ্ছবিৰ দৰে। বুজা-নুবুজাৰ মাজত দুৰি থাকে ৰাইজ। ৰাইজক পূৰ্ণ আশ্বস্ত কৰা প্ৰয়োজন— কিদৰে অৰণ্য, পৰিবেশ সংৰক্ষণ কিম্বা এটা প্ৰজাতি সংৰক্ষণৰ জৰিয়তে এখন গাঁও, এখন সমাজ উপকৃত হ'ব পাৰে। বহু সময়ত এই উপকাৰবোৰ দৃশ্যায়িত নহয়। সেয়ে প্ৰত্যাহ্বান অধিক। কেৱল জীৱন নিৰ্বাহৰ বাবে অৰণ্যৰ (ই ৰাষ্ট্ৰীয় উদ্যানেই হওক বা সাধাৰণ অৰণ্যই হওক) ওপৰত নিৰ্ভৰশীল প্ৰত্যন্ত অঞ্চলৰ লোকসকলক সংৰক্ষণত সফলভাৱে জড়িত কৰিব পৰা বৰ উজু নহয়। এনে লোকৰ সংখ্যাও নগণ্য নহয়। সংৰক্ষণৰ তাত্ত্বিক কথা বা আইন-কানুনৰ নীতি-নিয়মৰ মাজেৰে এয়া হয়তো সম্ভৱ নহয়। অসমত এনে জীৱন্ত সমস্যাবোৰৰ সমাধান কৰিব পাৰিলে বনাঞ্চল বেদখলকে ধৰি চোৰাংচিকাৰ আদি কৰি বহু আত্মকাল বহুলাংশে কমিব। অৱশ্যেই ইয়াৰ বাবে সদিচ্ছা, ধাৰাবাহিকতা, স্বচ্ছতাৰ উপৰি লাগিব সমন্বয়— চৰকাৰৰ বিভিন্ন বিভাগ, চৰকাৰী-বেচৰকাৰী সংস্থাৰ মাজত; সকলোৱে যে পৰিবেশ সংৰক্ষণৰ লগত প্ৰত্যক্ষভাৱে জড়িত হ'ব লাগিব তেনে কোনো কথা নাই। কোনোবাই এই প্ৰচেষ্টাৰ নেতৃত্ব দিয়াৰ বাবে আগবাঢ়ি আহিব লাগিব।

— জয়ন্ত কুমাৰ পাঠক

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Please submit your queries, feedback and submissions for Biolink at [pr@aaranyak.org](mailto:pr@aaranyak.org)



**King Cobra**  
*(Ophiophagus hannah)*

IUCN Status: Vulnerable  
Location: Digboi, Assam  
Date: 25 April 2012  
Photo Credit: Rajib Rudra Tariang



**Chinese Pangolin**  
*(Manis pentadactyla)*

IUCN Status: Critically Endangered  
Location: Dihing Patkai Wildlife Sanctuary, Assam  
Date: 12 May 2014  
Photo Credit: Gauri Buragohain



**Lord Derby's Parakeet**  
(*Psittacula derbiana*)  
IUCN Status: Near Threatened  
Location: Kibithu, Arunachal Pradesh  
Photo Credit: Udayan Borthakur



Author:  
Dhruvajyoti Kalita

People generally think about the protection of forest when we talk about wildlife conservation. No matter forests do play a leading role in maintaining the balance of the nature, apart from forests, animals, birds, insects etc do help in maintaining a balance in the ecosystem. Birds have a great role to play in this regards. But unfortunately, we are unaware of the favour done to us by the birds. There are many factors like poaching of birds which are causing a threat to the lives of birds as well to the human race. Threat towards the existence of birds means a threat towards human existence. So, we should together work for the protection of birds and nature. It will be possible to create a security and protection for the birds if every one of us understands the importance of the precautionary measures to be taken for the conservation of different species of birds.

Keeping in mind about the conservation of birds, Aaranyak, a society working for biodiversity conservation of North East India has published this book on "Birds Conservation Awareness".

To place an order for these publications, write to - [info@aaranyak.org](mailto:info@aaranyak.org)

BIOLINK is printed and published by Secretary General of Aaranyak, 50, Samanwoy Path, Survey, Beltola, Guwahati -781028, Assam, India. Communication address- Aaranyak, 13-Tayab Ali Byelane, BishnuRabha Path, BeltolaTinali-Bhetapara Link Road, PO: Beltola Telephone: +91-361-2230250, Telefax: +91-361-2228418, Email: [info@aaranyak.org](mailto:info@aaranyak.org) Web: [www.aaranyak.org](http://www.aaranyak.org)