



उत्तराखण्ड शासन



BRAHMAKAMAL



उत्तराखण्ड जैवविविधता बोर्ड
UTTARAKHAND BIODIVERSITY BOARD

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Chairman's Message

It is my great pleasure to extend greetings to the readers of the first issue of 'Brahmakamal', a quarterly newsletter of the Uttarakhand Biodiversity Board, Dehradun.

The 'Brahmakamal' (*Saussurea obvallata*), besides being the State Flower of Uttarakhand, is also a revered flower in the entire Himalayan Region, deriving its name from the reference in Hindu mythology being created by 'Brahma'. Even today, it is offered in prayers to the Gods. By being a symbol of the inter-connectedness between nature, culture and spiritual belief, it captures the essence of what biodiversity conservation needs today - the involvement of local communities. Associating biodiversity conservation with existing traditions and religious beliefs can go a long way in inducing voluntary practice of conservation measures by the local communities. We could not have picked a better name.

I congratulate Mr. R.N. Jha, Member Secretary, Uttarakhand Biodiversity Board, Mr. Dhananjay Prasad, Research Officer (Monitoring & Evaluation), Uttarakhand Biodiversity Board, Mr. Kunal Lal, Research Officer (Project) and all those who have contributed towards bringing out this informative newsletter.

Through this newsletter, we will make every effort to communicate our latest achievements, as well as the activities of the Board, along with information through articles and news stories relevant to the field of Biological Diversity, that the readers need to be aware of.

Any criticism, opinions and encouragement will be highly appreciated by the Board.



Dr. Rakesh Shah
Chairman
Uttarakhand Biodiversity Board

"Biodiversity
Conservation....

An art of living
with nature."

Colours
of
Summer



Message from the Member Secretary



R.N. Jha
Member Secretary

It is not coincidental that the global environmental crisis which includes rapid extinction of species concomitant with irreversible changes in ecosystems and all encompassing climate change is accompanied with the global economic crisis. The very same forces that govern the latter bring with it the former though with an unpredictable temporal relationship. The dominant mainstream paradigm puts the blame squarely on the shoulders of the broad masses of people indiscriminately and prescribes superficial solutions based on the assumption that the “invisible” hands of the market are the panacea if the “visible” hands of the state operate appropriately. It fails to appreciate that the very dynamics that leads to the above crisis can not bring about the solution but can only accentuate the problems.

In the face of irrefutable scientific evidences, most people have come to accept the fact that we have reached the point of a planetary emergency. In this light the foundations of the global system need to be thoroughly examined and replaced with a nature-friendly world view in the interest of vast population of suffering humanity.

It is clear now that the increasing number of extreme events have a lot to do with the above crisis. The recent destruction brought about by flash floods in the Himalayan region generally and Uttarakhand in particular is a tell-tale sign of the disease. The present issue of ‘Brahma Kamal’ is perfectly in line with these issues. Criticism and suggestions are most welcome.

From the Editor's Desk



Dhananjay Prasad
Research Officer
(Monitoring & Evaluation)

With the increase in population there is an exponential rise in the need and greed of the people which puts immense pressure on the finite natural resources and land. Conservation today has become a complex issue because of multiple stake-holders and the pulls and pressures of society. Therefore, collaboration, cooperation and active involvement of people in the process of conservation has become an important factor. Mainstreaming the practices of conservation and protection of biodiversity in the society has become essential and this can no longer be kept confined to the few Government agencies and the few pro-environment people. In fact our primary objective at present should be to induce a behavioral change among the majority population and interest groups having no inclination towards conservation.

Perhaps the largest meeting of the stake holders for Biodiversity conservation took place in Rio de Janeiro (Brazil) in 1992 which was participated by the representatives of 193 countries. The outcome of this Earth Summit was the establishment of the "United Nations Convention Biological Diversity" (CBD) which came into force on 28th December, 1993. India is also a signatory and party to the CBD since 1994. The Convention was built on three main principles or ‘pillars’ viz. conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

To achieve these objectives of CBD, the Biological Diversity Act, 2002 was enacted by Government of India, and it came into force on 1st October, 2003. Later Biological Diversity Rules, 2004 were also enacted which came into force on 15th April, 2004.

The implementation of the various provisions of the Act/Rules has to be carried out at three levels/bodies, namely by - the National Biodiversity Authority (NBA) at the National level, State Biodiversity Boards (SBB) at the State level and Biodiversity Management Committees (BMCs) at the local body level.

Today, the richness in biodiversity has become a symbol of recognition or an ‘identifier’ for any nation and the same is going to be the case with any state, region and locality in future. Let us join hands together to contribute in the process of conservation & protection of biodiversity of the area where we reside. This holy work is not only a tribute to nature but also a prayer to its creator - “God”.

Biodiversity Conservation – Need of the hour

Scientists estimate that life has existed on Earth for over 3.5 billion years and over 95% of the species that ever existed on this planet have gone extinct. It has been estimated that currently the planet is inhabited by several million species out of which about 1.8 million have been described by the scientists. Conservative estimates suggest that there are only 5–15 million species alive today although many groups of organisms remain poorly studied.

Over 15,000 new species are described each year and new species are also evolving during our lifetimes. Although new species appear, the existing species go extinct at a rate 1000 times faster than that of species formation. Many biologists agree that we are in the midst of a mass extinction, a time when 75% or more of species are lost over a comparatively short geological time scale. The last great mass extinction was about 65 million years ago, when the dinosaurs went extinct. The International Union for the Conservation of Nature & Natural Resources (IUCN) estimates that 22% of known mammals, 32% of amphibians, 14% of birds, and 32% of gymnosperms (all well-studied groups) are threatened with extinction. Species that were abundant within the last 200 years have gone extinct. e.g. Passenger Pigeons, numbering 3 to 5 billion in mid 1800s are now extinct.

Perhaps for the first time in the history of planet Earth, the activities of one single species i.e. man (*Homo sapiens*) may cause mass extinction of biodiversity.

Types of biodiversity

Most of us think that biodiversity is the heterogeneous assemblage of living organisms. This aspect of biodiversity is known as "**Species diversity.**" Biodiversity includes two other aspects as well, namely - "**Genetic diversity**" and "**Ecosystem diversity**".

Species diversity

The 1.8 million species described by science are incredibly diverse. They range from tiny, single-celled microbes like *Nanoarchaeum equitans* (400 nm in diameter living as parasites on other microbes in thermal vents at temperatures of 70–98°C) to giant organisms like *Sequoias* & Blue whales. While people are generally most familiar with multi-cellular organisms such as plants and animals, these organisms form only small branches on the tree of life. The greatest metabolic diversity is found among the prokaryotic organisms of the Eubacteria and Archaea.

Although some of the microbes use oxygen for respiration or photosynthesis, others have the extraordinary ability to derive energy from inorganic chemicals such as hydrogen sulphide or ammonia and they use carbon dioxide as their only source of carbon for producing organic molecules. Some organisms (Extremophiles) can survive in saturated salt concentrations (36% compared to approximately 3% for seawater) and some in superheated water in deep-sea vents and geysers.

We perceive that the new species being discovered each year would be microscopic organisms that can only be distinguished at the metabolic level. But it is not true as most of the new species identified are insects, microbes and fungi. We are still discovering new vertebrates such as a new species of **Baleen whale** and **Clouded leopard**. Since 2000, as many as 53 new species of primates including a new species of Brazilian monkey, **Mura's saddleback tamarin** have been described.

Dhananjay Prasad

Research Officer

(Monitoring & Evaluation)



Aconitum balfourii

"This curious world
which we inhabit is more
wonderful than it
is convenient;
more beautiful than
it is useful;
it is more to be admired
and enjoyed than it is
to be used"

Henry David Thoreau



Gloriosa superba



Eichhornia crassipes



Calanthe tricarinata

"Biodiversity Conservation – An art of living with nature"



View of Ganga

Genetic Diversity

Genes are responsible for the traits exhibited by organisms. Since genes reside within species which carries "genetic potential", therefore when any species go extinct, its unique genetic variants are lost.

Crops grown in monocultures (genetically homogeneous individuals) can be entirely damaged by insect pest or environmental change. Most of our high-yielding varieties show significant reductions in yield within about 5 years because pests overcome the crops' natural defence. Plant breeders look to wild plant relatives and to locally grown land races to find new genetic varieties so that they can introduce these genes into crops to renew their vigour. Genetic variation allows species to evolve in response to diseases, predators, parasites, pollution, and climate change. The **Red Queen Hypothesis**, named for Lewis Carroll's character states that organisms must continually evolve so as to not succumb to their predators and parasites.

According to the UN Food and Agriculture Organization, 96% of the 7,098 US apple varieties cultivated prior to 1904, 95% of the US cabbage varieties, and 81% of tomato varieties, are extinct, and the genes that made these varieties unique are no more.

In addition to traditional breeding, advances in genetic engineering have allowed scientists to introduce beneficial genes from one species to another. For example, diabetics earlier used to depend on insulin from human cadavers, or from cows or pigs. Human insulin was expensive, and non-human insulin could cause allergic reactions. Now we can isolate the gene that codes for human insulin, insert it into bacterial cells, and let the bacteria produce large quantities of human insulin. Other notable feats in genetic engineering include the introduction of genes that enhance the nutritive value of food, create crop resistance to insect pests, induce sheep to produce a protein for treating cystic fibrosis disease, and alter bacteria so that they can clean up toxic mine wastes through their metabolic activities. Many other genetic manipulations are currently under development.

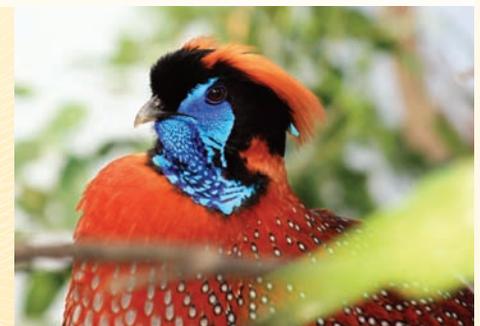
Ecosystem Diversity

Ecosystems include all the species, plus all the abiotic factors characteristic of a region. For example, a desert ecosystem has soil, temperature, rainfall patterns, and solar radiation that affect not only the species occurring there, but also the morphology, behaviour and the interactions among existing species. An ecosystem remains intact only if biological processes are preserved. These processes include nutrient and water cycling, harvesting light through photosynthesis, energy flow through the food web, and patterns of plant succession over time. A conservation focus on preserving ecosystems not only saves large numbers of species but also preserves those support systems that maintain life.

Why Conserve Biodiversity?

Even from a selfish point of view, we humans should be concerned about saving biodiversity because of the two most important benefits that it provides us – **biological resources** and **ecosystem services**. However, it provides many other benefits including **social and spiritual benefits** as well.

"Even from a selfish point of view, we humans should be concerned about saving biodiversity because of the two most important benefits that it provides us - biological resources & ecosystem services."

*Uncia uncia**Moschus chrysogaster**Tragopan satyra*

"Biodiversity Conservation - An art of living with nature"

Biological Resources

Biological resources are those products that we harvest from nature. These resources fall into several categories: food, medicine, fibres, wood products, and more. For example, over 7,000 species of plants are used for food, although we rely heavily on only 12 major food crops. Most of the human population depends on plants for medicines. In the developed world, many of our medicines are chemicals produced by pharmaceutical companies, but the original formulas were often derived from plants. For example, opiate pain relievers are derived from poppies, aspirin is derived from willows, quinine for treating malaria comes from the *Chinchona* tree, the rosy periwinkle (*Vinca rosea*) and Pacific yew (*Taxa brevifolia*) both provide substances used in chemotherapy to inhibit the cell division of cancerous cells. Fibres for clothing, ropes, sacking, webbing, netting, and other materials are provided by a large number of plants, including cotton plants, flax plants (linen), hemp (cordage and sail canvas), *Agave* plants (sisal), *Corchorus* plants (jute), bamboo and palms. Trees provide the wood products used in making homes, furniture and paper products.

In addition, living organisms provide inspiration for engineers seeking better and more efficient products. The field known as bio-mimicry is the study of natural products that provide solutions to human needs. For example, shark skin provided the model for hydrodynamic swimming suits. The glue used by Sandcastle worms (*Phragmatopoma californica*) to cement together their sand particle shells was the inspiration for a glue that mends fractured bones in the aqueous internal environment of the body. Finally, scientists are using the chemical nature of spider's silk to design strong, lightweight fibres.

Ecosystem Services

Ecosystem services are processes going on within nature that support human life. These services include the decomposition of waste, pollination, water purification, moderation of floods, renewal of soil fertility etc. Ecosystem processes are often overlooked, and we do not generally value it as part of the economy until they cease to function. When economic value is assigned to these services, it is often startlingly high. For example, insect pollinators help produce many commercially important fruits such as almonds, melons, blueberries, and apples. The global economic value of pollination services performed by insects has been valued at \$217 billion per year (Gallai *et al.* 2009).

How does a process like water purification work? Rain water is filtered by soil and by microbes that can break down nutrients and contaminants, and reduce metal ions, slowing their spread into the environment. Wetland and riparian plants absorb nitrogen, and trap sediments that decrease water quality. Biodiversity underlines the ability of the environment to supply clean water. There are about 35 million cubic kilometers of fresh water on earth out of which 24.4 million cubic kilometers are as glacial ice, perma frost and permanent snow, 10.7 million cubic kilometers as ground water and soil moisture, 0.1 million cubic kilometers in lakes and marshes and 0.002 million cubic kilometers as rivers. We must understand that our natural resource – 'Water' is renewable but not replaceable. Since there is no direct substitute of water therefore, the conservation of biodiversity cannot be imagined without water.

Human construction and development disrupt natural environments, but most habitats have an extraordinary ability to recover when given the chance. This is because dormant seeds in the soil can germinate, stabilize the soil, and initiate events of succession that restore vegetation which provides food and structure for other colonizing organisms. Native plants like fireweed can help re-vegetate an area after fire.

Social and Spiritual Benefits

Throughout human history, conservation has involved protecting nature for the spiritual gifts it provides, and protecting sacred places in the local landscape. Stories of indigenous people incorporate detailed knowledge of the animals and plants that make up their world. The heterogeneity of the world's mythology, folk art, and folk dances show the effects of biodiversity on cultural development, and contribute to the richness of global arts and literature. Biodiversity today, is in fact the introduction of any nation and the conservation of nature, culture, tradition and religion is the conservation of biodiversity in true sense.



Mycteria leucocephala

“Human construction and development disrupt natural environments, but most habitats have an extraordinary ability to recover when given the chance.”



Jageshwar
Group of Temples

In Focus - Jageshwar

Alok Mishra
JRF

Jageshwar is a famous Hindu pilgrimage dedicated to Lord Shiva located 36 km away from Almora in Kumaun region. The temple city comprises a cluster of 124 large and small stone temples, dating 9th to 13th century AD, many of them being preserved by the Archaeological Survey of India (ASI). Dandeshwar Temple, Chandi-ka-Temple, Jageshwar Temple, Kuber Temple, Mritunjaya Temple, Nanda Devi temple, Nava-grah temple and Surya Temple are some of them. Mritunjaya Temple is *the oldest* and Dandeshwar Temple is *the biggest shrine*. The site is located at an altitude of 1870 mts in **Jataganga river valley** near a Deodar forest starting from Artola village on Almora-Pithoragarh highway, where two streams Nandini and Surabhi flow down the hills and meet near the sacred spot. The pilgrimage to Jageshwar is considered as sacred as the famous 'Chardham yatra'.

Jageshwar is believed to be the site of first of the twelve Jyotirlingas known as Nageshvara Jyotirlinga. The two main festivals celebrated here are - '**Jageshwar Monsoon Festival**' which is held in *Shravan* (between 15 July to 15 August) and '**Maha Shivratri Mela**' which takes place during *spring season*.

There is no definite dating of the construction of Jageshwar group of temples but according to the ASI, they belong to the post-Gupta and pre-medieval eras and are estimated to be about 4500 yrs old. These temples range in the period from the 8th century (Katyuri Dynasty) to the 18th century (Chand Dynasty). It is believed that **Adi Shankaracharya** visited Jageshwar and renovated and re-established many temples before leaving for Kedarnath.

The Archeological Museum run by Archaeological Survey of India (ASI), houses idols and statuettes removed from Jageshwar shrine dating 9th to 13th century AD. The forest area surrounding Jageshwar group of temples is undoubtedly rich forest with Deodar as dominating species. The site represents a positive interface between Nature, Culture and Religion.

Under Section 37 of the Biological Diversity Act, 2002 the State Government in consultation with local bodies may notify in an official gazette, areas of biodiversity importance as Biological Heritage Sites (BHS). Declaring this area as BHS will be a matter of pride to the local communities and may also contribute to the objectives of both conservation and livelihood security.

The possibility of declaring Jageshwar Temple area as Biological Heritage Site (BHS) is being considered by the Uttarakhand Biodiversity Board.

Criteria for selection of BHS

- Areas that contain a mosaic of natural, semi-natural and man-made habitats, which together contain a significant diversity of life forms.
- Areas that contain significant domesticated biodiversity component and/or representative agro-ecosystems with ongoing agricultural practices that sustain this diversity.
- Areas that are significant from a biodiversity point of view as also are important cultural spaces such as sacred groves/trees and sites, or other large community conserved areas.
- Areas including very small ones that offer refuge or corridors for threatened and endemic fauna and flora, such as community conserved areas or urban greens and wetlands.
- All kinds of legal land uses whether government, community or private land could be considered under the above categories.



"Biodiversity Conservation - An art of living with nature"

About BMCs & PBRs

Under Section 41(1) of the **Biological Diversity Act, 2002**, every local body in the State shall constitute a Biodiversity Management Committee (BMC) within its area for the purpose of promoting conservation, sustainable use and documentation of biological diversity. Section 22 of the Biological Diversity Rules of 2004 promulgated under this act, in force as of 15th April, 2004 include the following provisions for the **constitution of BMCs and preparation of People's Biodiversity Registers (PBRs)**:

Constitution of Biodiversity Management Committees (BMCs).

- (1) Every local body (i.e. Panchayat, Municipality, etc.) shall constitute a Biodiversity Management Committee (BMC) within its area of jurisdiction.
- (2) The Biodiversity Management Committee as constituted under sub-rule (1) shall consist of a Chairperson and not more than six persons nominated by the local body, of whom not less than one third should be women and not less than 18% should belong to the Scheduled Castes/ Scheduled Tribes.
- (3) The Chairperson of the Biodiversity Management Committee shall be elected from amongst the members of the committee in a meeting to be chaired by the Chairperson of the local body. The Chairperson of the local body shall have the casting votes in case of a tie.
- (4) The tenure of the Biodiversity Management Committee shall be of five years or co-terminus with the tenure of the local body (Guidelines for the Operationalization of the Biodiversity Management Committees).
- (5) The local Member of Legislative Assembly/ Member of Legislative Council and Member of Parliament would be special invitees to the meetings of the Committee.
- (6) The main function of the BMC is to prepare People's Biodiversity Register in consultation with the local people. The Register shall contain comprehensive information on availability and knowledge of local biological resources, their medicinal or any other use.
- (7) The other functions of the BMC are to advice on any matter referred to it by the State Biodiversity Board or Authority for granting approval, to maintain data about the local vaid and practitioners using the biological resources.
- (8) The Authority and the State Biodiversity Boards shall provide guidance and technical support to the Biodiversity Management Committees for preparing People's Biodiversity Registers.
- (9) The People's Biodiversity Registers shall be maintained and validated by the Biodiversity Management Committees.

As stated above, the preparation of PBRs is the main function of a BMC. **Technical Support Groups** comprising of experts from subject areas under the ambit of biodiversity, provide technical inputs to the BMCs and are responsible for the validation of the prepared PBR. The Uttarakhand Biodiversity Board also assigns local **NGOs** to act as ground level facilitators to the BMCs in this exercise.

The Guidelines for the preparation of PBRs issued by the National Biodiversity Authority provides 31 formats or categories under which data has to be recorded. The preparation of a People's Biodiversity Register is a **participatory process**. The following is a step-by-step process for the preparation of PBRs:

1. Formation of Biodiversity Management Committee at the Gram Panchayat Level.
2. Organizing a meeting to sensitize people about the objectives and benefits of the exercise.
3. Training of members in identification and collection of data on biological resources and traditional knowledge pertaining to health.
4. Collection of data. (Data collections include review of literature on the natural resources of the districts, Participatory Rural Appraisal (PRAs) at the village level, household interviews, individual interviews with village leaders and knowledgeable individuals, household heads, key actors of the Panchayat Raj institutions and NGOs and direct field observations.
5. Analysis and validation of data in consultation with the technical support group and BMCs.
6. Preparation of People's Biodiversity Register (PBR).
7. Computerization of information and resources.



'The main function of the BMC is the preparation of a People's Biodiversity Register in consultation with the local communities.'

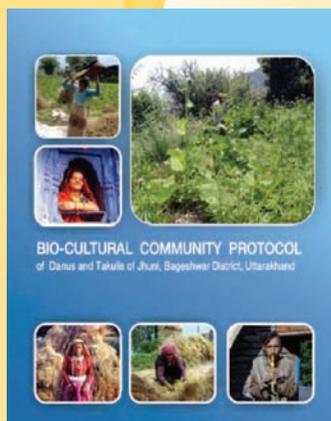


So far

652 BMCs constituted

13 PBRs prepared

About BCPs



So far

07 BCPs
have been prepared

The term Biocultural Rights gained visibility at the Rio Convention for Sustainable Development where the emphasis was given to ensure the rights of indigenous and local communities for whom conservation of biological diversity was a way of life. Biocultural Rights were at the time defined as **collective rights of indigenous and local communities that acknowledge the relationship between communities, bio-resources and culture.**

Bio-cultural communities, or Indigenous and Local Communities (ILCs), have been recognized as the 'Guardians of Biodiversity', for their essential contribution to the conservation of wild biodiversity, including flora and fauna, as well as ecosystems and landscapes, through the sophisticated traditional knowledge systems that they have developed over generations, trying to ensure long term sustainability of their production systems and their natural environment.

There has been a concern that the development of international environmental laws and guidelines focus disproportionately on protecting the environment and access to ILCs traditional knowledge without also empowering the ILCs to ensure the conservation and sustainable use of their natural resources and wider use of their traditional knowledge according to their bio-cultural values. The development of Bio-cultural Community Protocols (BCPs) by the ILCs is one way in which communities can increase their capacity to drive the local implementation of international and national environmental laws. **A BCP is a protocol that is developed after a community undertakes a consultative process to outline their core ecological, cultural and spiritual values and customary laws relating to their Traditional Knowledge and resources, based on which they provide clear terms and conditions to regulate access to their knowledge and resources.**

A BCP can also be defined as - **A declaration of the community that defines who they are, their values, their cultural relationship with their land and resources and under what principles and power structures they govern themselves.**

The process of developing a BCP involves reflection about the interconnectedness of various aspects of ILCs' ways of life (such as between culture, customary laws, practices relating to natural resources management and Traditional Knowledge) through resource mapping, evaluating governance systems and reviewing community development plans. It also involves **legal empowerment** so that community members can better understand the international and national legal regimes that regulate the various aspects of their lives.

The general issues that should be included in a Biocultural Community Protocol are:-

1. A self-definition of the group, its leadership and decision making processes.
2. The links between the customs of the group and the use of bio-resources in different fields as an integral part of their daily life.
3. Their spiritual understanding of nature.
4. How the knowledge and resources are shared.
5. How the group promotes *in-situ* conservation – of indigenous plants/indigenous breeds of livestock/wildlife etc., with details of these resources.
6. The need to acquire consent of BMC to access the land and traditional knowledge of the group.
7. Local challenges faced by the community.
8. Rights of the community over the bio-resources according to national and international law.
9. A call to various stakeholders for respect of their customary laws and their community.
10. Various types of assistance needed by the community.

So far, 07 BCPs have been prepared for Medicinal Plant Conservation Areas (MPCA) namely Jhuni (Bageshwar), Mohan (Almora), Kandara (Uttarkashi), Gangi (Tehri Garhwal), Mandal (Chamoli), Bastiya (Champawat), Khaliya (Pithoragarh).

Biodiversity in ISLAM

"The absolute destruction of any species of animals or plant by man cannot be justified; nor should any be harvested at a rate in excess of its natural regeneration."

-Environmental Protection in Islam (part 5 of 7)

Islam is the second largest religion often termed as Deen-e-Abrahami (Religion of Abraham) started by Prophet Mohammed in 6th century AD. The Arabic world "slam" signifies peace & submission. Islamic teachings and philosophy are intricately close to the concept of biodiversity conservation. There is no denying the importance of plants and animals as living resources of enormous benefit, without which neither man nor other species could survive. God has not made any of his creatures worthless: every single form of life is special and intricate and each warrants special respect. God has declared in the Glorious Quran: **"There is not an animal on the earth or any being that wings its flight, but are a people like unto you.."** (Quran 6:38)

According to Muslim belief, the earth is a sanctuary in which mankind was made to dwell in comfort. The vast oceans, forests, and mountains that make up the bountiful planet have been subdued by God for our enjoyment and productive use. Further, God compels Muslims in the Quran to respect and revere the environment when he says, **"Greater indeed than the creation of man is the creation of the heavens and the earth"** (40:57). It has repeatedly been mentioned in Holy Quran through various verses to maintain the balance of nature. It has also warned time and again not to be wasteful and to maintain peace and harmony with all other creations. Protection, preservation and compassion for God's creation other than the human beings can be regarded as "Haqqal Makhloof" (rights of animals/Plants etc) which is the third most important obligation in Islamic doctrine after "Haqqal-Allah" (rights of God) and "Haqqal-Ibad" (rights of humans). There is hardly any chapter of Islamic "Fiqa, Ljima or Quiyas" (by-laws) that does not deal with animals and their habitat.

Planting trees and cultivating land instead of leaving it barren and unfruitful is an integral part of Islam. The Prophet Mohammad told his followers that they would be rewarded by God for taking care of the earth. God has said:

"Then let man consider his nourishment: that we pour down the rain in showers, and we split the earth in fragments, and therein make the grain to grow, and vines and herbs, and olives and palms, and gardens of dense foliage, and fruits and fodder – provision for you and your cattle." (Quran 80:24-32)

Islam has urged humanity to be kind to nature and not to abuse the trust that has been placed on the shoulders of man. In fact, to be kind to animals is an integral part of Islam for Muslims. The Glorious Quran mentions the aesthetic functions of these creatures as objects of beauty in addition to their other functions. God has made in plants and animals that which excites wonder and joy in man's soul. It also mentions other functions which these creatures perform and which man may not perceive. God has said, **"Do you not see that to God bow down in worship all things that are in the heavens and on the earth – the sun, the moon, the stars, the mountains, the trees, the animals ..."** (Quran 22:18)

Islam emphasizes all measures for the survival and perpetuation of these creatures so that they can fully perform the functions assigned to them. Love for nature and its conservation has been strongly backed in teachings of many Islamic Sufis, poets and philosophers. The absolute destruction of any species of animals or plant by man cannot be justified; nor should any be harvested at a rate in excess of its natural regeneration. This applies to hunting and fishing, forestry and wood-cutting for timber and fuel, grazing, and all other utilization of resources. It is imperative that the genetic diversity of living beings be preserved- both for their own sake and for the good of mankind and all other creatures as it reflected in the following lines of Quran(31:10)

*"He created the heavens without any pillars that you can see;
He sat on the earth-mountains standing firm lest it should shake with you
He scattered through it beasts of all kinds, we send down rain from the sky
And produce on earth every kind of creature, in pairs."*

"A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise"

Albert Einstein



"We should preserve every scrap of biodiversity as priceless while we learn to use it and come to understand what it means to humanity"

E.O. Wilson

Activities of the Board



International Day of Biological Diversity - 22nd May, 2013

The day 22nd May is celebrated as **the International Day for Biological Diversity** in each of the 193 countries which are party to the Convention on Biological Diversity (CBD). Every year, CBD declares a theme for its celebration and the theme for 2013 was **'Water and Biodiversity'**, highlighting the relationship between biological diversity and the conservation of water as a natural resource. Also, this theme coincides with the declaration of the year 2013 as the 'International Year for Water Cooperation' by the United Nations.

Uttarakhand Biodiversity Board celebrates the International Day for Biological Diversity each year focusing primarily on raising awareness among the people. This year, programmes celebrating the International Biodiversity Day, 22nd May, 2013 were carried out in three divisions – Nainital, Chakraka, and Haridwar – apart from the main programme which was organized by the Uttarakhand Biodiversity Board in the conference hall of the Hotel Madhuban, Dehradun. **Padmashri Dr. Anil Prakash Joshi**, one of the most respected figures in the field of environment was the Chief Guest of the event. The special guests on the panel apart from the Chief Guest included Dr. B.S. Burfal, former Chairman, Uttarakhand Biodiversity Board, Dr. R.B.S. Rawat, PCCF, Uttarakhand and Dr. Rakesh Shah, Chairman, Uttarakhand Biodiversity Board. Dr. Joshi in his address highlighted the necessity of including protection of water sources and biodiversity in our developmental programmes and called for an overall objective of achieving **'Green Growth'** instead of compromising the environment to achieve a purely developmental growth.

On this occasion, a report prepared by the National Biodiversity Authority, titled **'Watering Biodiversity, Ecosystems Management'**, was officially launched, and the copies of the report were distributed among the guests & the participants.



In order from left (Dr. B.S. Burfal, Dr. Rakesh Shah, Chairman, Padamshree Dr. Anil Prakash Joshi, Dr. R.B.S. Rawat, PCCF)



Dr. Veena Chandra (right) planting a sapling

the Beej Bachao Andolan) and emphasized on the need for a behavioral change allowing for conservation to come voluntarily, instead of having to rely on large-scale Government programmes. Such behavioral change can be inspired through responsible environmental journalism, by setting realistic, achievable and productive goals and taking steps at the individual level, such as following the principles of refuse, reduce, reuse & recycle, conserving water, electricity and acting for the benefit of society & future generations over self for once.

Earth Day - 5th June, 2013

The day 5th June is celebrated as **the Earth Day**. Uttarakhand Biodiversity Board in collaboration with a Dehradun based NGO - SAMVEDI, organized a Panel Discussion at Sri Guru Ram Rai Institute of Medical Health Sciences, Dehradun, on the theme **'Climate Change & Biodiversity - A Planetary Emergency'**. The panel members included Shri Vijay Jardhari, an eminent leader of the 'Beej Bachao Andolan'; Shri Jai Prakash Panwar, media personnel; Dr. Vinod Bhatt, Navdanya NGO; Shri Harak Singh Rawat, City Magstrate, Dehradun; Dr. S.P. Thapliyal, Director, Shri Guri Ram Rai Institute of Science & Technology, Dehradun; Shri, R.N. Jha, Member Secretary, Uttarakhand Biodiversity Board & Dr. Veena Chandra, Scientist, FRI. The panel discussion was preceded by a **plantation of Rudraksh tree saplings** at a selected site within the campus.

The panel members in their respective addresses expressed concern over the loss of the diversity of biological resources, visible through the loss of crop species (an issue at the core of

Regional Workshop on awareness raising and capacity-building to support the ABS mechanism under CBD and Nagoya Protocol

From 15th - 17th May 2013, a regional workshop was held with help of ICIMOD, Kathmandu, Nepal in collaboration with "Sichuan Academy of Environmental Sciences, Chengdu Institute of Biology, CAS and Kunming Institute of Botany, CAS, China at Chengdu, Sichuan, P. R. China.

The broad objective of the regional workshop was to exchange and share experience about the ratification and implementation of the Nagoya Protocol on Access & Benefit Sharing (ABS). More specifically the workshop helped bringing countries together into a regional forum to discuss and identify common trans boundary and other issues related to ABS and the corresponding challenges at national level. Participants also discussed some of the important articles of the Nagoya Protocol.

Myanmar, Nepal, and Pakistan, some resource persons from China, India and Nepal, the Secretariat of the CBD, The ABS Capacity Development Initiative of GIZ, Natural Justice and ICIMOD.

Two days were devoted to the presentations followed by discussion from CBD secretariat, GIZ, representative of the participating countries, ICIMOD, resource institutions from China, India and Nepal. Third day the group was taken to visit one of the heritage sites Emeishan (Emei Mt.), Leshan, Sichuan.

It is quite evident that most of the countries are still struggling with the implementation of the third pillar of CBD i.e. Access and Benefit Sharing arising out of the use of the genetic material. But India as a signatory country to CBD has done a commendable work by enacting the Biological Diversity Act, 2002 and later by forming the Biological Diversity Rules, 2004. Though, not directly but several provisions of the BD Act, 2002, take care of the provisions of the Nagoya Protocol. India is one of the 17 countries in the world that has ratified the Nagoya Protocol. India is way ahead of several countries, that participated in the workshop in placing on ground a robust and workable system of the implementation of the provisions of the CBD through BD Act, 2002. India is also one country that has started the process of the documentation of the bio-resources available and the traditional knowledge associated with it. By making the bio-cultural community protocols (BCP), India becomes first country in the region (may be in the world). By developing Traditional Knowledge Digital Library (TKDL) India has taken a huge stride in protecting the traditional knowledge.



Dr. Rakesh Shah, Chairman, Uttarakhand Biodiversity Board along with the delegates at the Workshop

"The truth is: the natural world is changing. And we are totally dependent on that world. It provides our food, water and air. It is the most precious thing we have and we need to defend it."

David Attenborough

"To be poor without trees, is to be the most starved human being in the world. To be poor and have trees, is to be completely rich in ways money can never buy"

Clarissa Pinkola Estes

Colours of Summer



The season of spring welcomes new life, while the season of monsoon nourishes it. In between lies Summer, the season of the sun. Summer occurs normally from June to August in the Northern hemisphere and from December to February in the Southern hemisphere. In the tropics however, summer generally occurs in the months of April, May and June, giving way to the monsoons. It is the warmest season of the year, characterized by long spells of heat with temperatures averaging around 40-45 degrees Celsius, interspersed with the occasional thunderstorm, as if to break the monotony.

Summer is a season of growth, when vegetation, particularly fruits and cereals reach maturity and are harvested.

It is a season of the highly awaited Mango, the king of fruits, accompanied by litchi, grapes and water melon.

It is a season of Dahlias, Lilies, Begonias, Hydrangeas, Marigold, Lavender, Petunias and Hibiscus, but nothing says summer like the Sunflower.

It is a season of fire, when the leafless 'Palash' blooms with the 'Flame of the forest', while many others succumb to the more frequent forest fires.

It is a season awaited by school children for the vacations that often accompany it, along with the fruit juices & cold beverages, the ice-cream, the swimming sessions, the memorable trips to the hill stations, and the air-conditioners.

" Living wild species are like a library of books still unread. Our heedless destruction of them is akin to burning the library without ever having read its books."

Jon Dingell

A year without summer...

In the year 1816, some parts of the world experienced the absence of summer. There was a severe lack of sunlight, persistent 'dry fog', ice in the lakes and rivers of the North East United States & Pennsylvania. There was a dramatic swing in temperatures from 35°C to near freezing in a matter of hours.

The 'Year without Summer' resulted in an agricultural disaster, affecting lives across the United State, Atlantic Canada, and parts of Western Europe including Ireland, France and England. Frost killed off most of the crops that had been planted, only one-fourth of the hay was cut and only 10% of the crop could be harvested. Yield from the orchards ranged from moderate to barren, farmers had to turn to selling their cattle due to shortage of hay. There was a major food shortage across the entire northern hemisphere. Food riots broke out in the UK and France and grain warehouses were looted. Due to the famine, the Government of Switzerland had to declare a national emergency. Around 2 lakh deaths were recorded during the period. The year 1816 is therefore also remembered as the 'Poverty Year'.

Our lives are dominated by the seasons of the year, by the colours associated with each one of them. Summer is the season of the sun, the provider of energy for all life on our planet earth.



Biodiversity News

50 per cent flora/fauna may be lost due to Climate change

The rise in global temperatures to above preindustrial levels is expected to reach the ominous figure of 4°C by the year 2100, if current conditions persist. This could have disastrous implications on the biodiversity of the planet, in terms of loss of crucial habitats. The accelerated extinction of floral and faunal species may lead to the collapse of significant ecosystems, which will, in turn, have severe impacts on agriculture & food production, as well as availability of fresh water.

If nothing is done to reduce/ slow down the amount of global warming the resultant change in climate could lead to decline of more than 50 per cent of common plants and 33 per cent of animals by 2080 - a research paper has revealed. The researchers looked at 50,000 globally widespread and common species. Plants, reptiles and particularly amphibians are expected to be at greatest risk. Sub-Saharan Africa, Central America, Amazonia and Australia will lose the most species of plants and animals.

The study was led by Dr Rachel Warren from the Tyndall Centre for Climate Change Research at UEA in collaboration with Dr Jeremy VanDerWal of James Cook University, Australia and Dr Jeff Price, from UEA's school of Environmental Sciences. He said that climate change will greatly reduce the diversity of even very common species found in most parts of the world, asserting that this loss of global-scale biodiversity will significantly impoverish the biosphere and the ecosystem services it provides. He added that the prompt and stringent action to reduce greenhouse gas emissions globally would reduce these biodiversity losses. The research has been published in journal Nature Climate Change.

This damage can however be greatly reduced if emissions are scaled down. It is estimated that losses to biodiversity will be reduced by up to 60% if the global emissions peak by 2016 and are then scaled down by 5% each subsequent year.

Climate Refugees

What are Climate Refugees?

Broadly speaking, climate refugees include people who have been displaced from their homes by the impact of climate change.

This includes, apart from the island dwellers who have had to migrate to higher ground due to the rise in sea level, the families living in the far north in Alaska (U.S.), who have experienced flooding, erosion and loss of land due to the melting of sea ice and permafrost, known to be the signature effects of climate change.

What separates them from those forced to leave their homes due to a single cataclysmic event is the fact that Climate change is a relatively slow process, however, the impacts are very real for the 180 or so communities that are facing relocation due to the ice melt.

A project to catalogue the world's entire plant species by 2020

Four of the world's leading botanical institutions are compiling a catalogue of every plant on the earth - at least 400,000 species - to be made available online by 2020. The institutions are St Louis-based Missouri Botanical Garden and New York Botanical Garden in the United States, Royal Botanic Garden Edinburgh and the Royal Botanic Gardens, Kew in the United Kingdom. Australia will be a major contributor to the project as there is about 20,000 species in Australia which is a significant portion of the world's flora. World Flora will have a comprehensive run-down of every known plant species, including images and scientific information.

The Australian National Botanic Gardens is currently working on an online inventory of Australia's plants, which is expected to be completed in next five years. The complete inventory will be supplied to organisers of the catalogue. The catalogue's electronic format will add up new discovered species. One of the biggest challenges organisers face is finding the resources to collate all the information in developing countries.

“One third of animal species will be hit by climate change”

(Source: Guardian, UK)

“186 Alaskan villages are at risk because of climate change”

“\$ 130 million could be the full cost of moving just one village”

(Source : Guardian, UK)





133 New species of fauna discovered in India

Scientists have discovered 133 new species of fauna in India. Among the most significant is a bird which is yet to be named has been found in the Great Nicobar Island. Scientists have also discovered new species of spiders, reptiles, insects and fish in various parts of the country that have been compiled by the Zoological Survey of India (ZSI) in 'Animal Discoveries 2012'.

India has only about two percent of the world's land surface, but is known to have over 7.52 percent of the total animal species in the world. It is estimated that about twice the present number of species still remain to be discovered in India alone. India accounts for over 92,000 animal species. Apart from these, scientists have also found 109 species of animals recorded for the first time in India. Scientists have also reported 42 species of hard and soft corals from the Andaman and Nicobar chain of islands. The ZSI collaborates with various universities and colleges in India to document new species. The present state of knowledge does not go beyond a total of 1.7 million species of plants, animals and microbes on earth.

Vultures - on the brink of extinction

Vultures are critically endangered species facing the threat of extinction. As per our study, the population of white - backed Vultures (*Gyps bengalensis*) has declined over 99% in last 20 years in Indian sub-continent. The major reason for the for this decline is the use of sodium diclofenac in the treatment of domestic live stock infect the vultures are exposed to this deadly drug through the live stock carcasses on which they feed.

In response to the objections raised by some of the NGO's the Govt. of Maharashtra issued an order to trickle mail practices related to the veterinary use of diclofenac. The said order of Maharashtra Govt. can be downloaded from www.savevultures.org. The recovery of vulture population can be attained by the removal of diclofenac from the food supply of domestic livestock.



The Conflict over Coal: Mineral or Bioresource?

Claiming Coal to be a bioresource, the Madhya Pradesh Biodiversity Board issued notices to Coal India Limited (CIL) under the Biological Diversity Act, 2002, seeking penalty for engaging in commercial mining of the biological resource without the permission of the Board.

As per Sec. 7 and 24(1) of the Biological Diversity Act, 2002, any person who is a citizen of India or a body corporate, association or organization which is registered in India shall obtain any biological resource for research or commercial utilization or bio-survey and bio-utilization only after prior intimation to the concerned State Biodiversity Board.

Following a PIL filed by the Biodiversity Management Committee (BMC) of the Eklehra Panchayat in the Chhindwara district of Madhya Pradesh against CIL, the MP State Biodiversity Board had asked three subsidiaries of CIL – South Eastern Coalfields, Western Coalfields and Northern Coalfields, along with a private captive miner – BLA Industries, to explain why they were engaging in the commercial mining of a 'bioresource' without its permission. Also, as per the provisions of the BD Act, 2002, having one of its mandates as 'fair & equitable sharing of benefits arising from the utilization of biological resources', these subsidiaries were asked to share 2% of their turnover with the BMCs having jurisdiction over the bioresource.

However, CIL has dismissed the claim and is opposed to the imposition of such a benefit sharing levy on coal companies, arguing that coal is a mineral and should not be treated as a bioresource simultaneously.

The Coal Ministry has now taken up the issue with the Environment Ministry. The matter is now in front of the National Green Tribunal, and is expected to result in what might probably be a landmark decision in the field of biological diversity.



Obligations of Institutions under BD Act, 2002

As per section (7) and 24(1) of Biological Diversity Act, 2002, any person who is citizen of India or a body corporate, association or organization which is registered in India shall obtain any biological resource for research or commercial utilization or bio-survey and bio-utilization only after prior intimation to the concerned State Biodiversity Board in prescribed Form-1 along with the fees (Form-1 is an application form for commercial use and associated traditional knowledge/access to biological resources/collecting of biological resources).

On receipt of intimation accompanied by a fee, the State Biodiversity Board, in consultation with the concerned local bodies and after making enquires, may by order permit or prohibit any such activity on merit within a period of 6 months.

Broadly speaking, most of the industrial units do use one or more bio-resource in the production of different goods from some source which may be direct or indirect. Some of the classified organizations/ industrial units/undertakings/private companies using bio-resource for commercial purpose are:

1. Herbal Industries
2. Forestry based industries (including Minor forest produce based)
3. Pulp and Paper industry
4. Sugar Mills
5. Distilleries
6. All food processing units
7. Soya industries
8. Spinning/Textile mills
9. Other Agro and Bio based industries
10. Coal Mining Industries
11. Industries using Coal Bio-resource and, there can be many more.

Apart from the above, there can be Government/Semi Govt. Departments/Corporations using bio-resource for commercial purpose, some of which are:

1. Forest Department
2. Minor Forest Produce Federation
3. Uttarakhand Forest Development Corporations
4. Fisheries Department
5. Sericulture
6. Horticulture
7. Animal Husbandry
8. Agriculture and, there can be many more.

Therefore, all Organizations, Departments, Undertakings, Private Companies, Industrial units involved in the utilization of bio-resource or bio-survey and bio-utilization for commercial purposes must keep in mind the following two most important obligations:

1. They must take prior consent by applying in the prescribed Form-1 (as provided in Biological Diversity Act, 2002) to Member Secretary, Uttarakhand Biodiversity Board.
2. They have to sign a MoU (Memorandum of Understanding) with the Board for the sharing of benefits arising out of the use of "Biological Resources".

What are Biological Resources?

Plants, animals and micro-organisms or parts thereof, their genetic material and by products (excluding value added products) with actual or potential use or value, but does not include human genetic material.

Section 2(c) of Biological Diversity Act, 2002

What is Commercial Utilization?

The end uses of biological resources for commercial utilization such as drugs, industrial enzymes, food flavours, fragrance, cosmetics, emulsifiers, oleoresins, colours, extracts and genes used for improving crops and livestock through genetic intervention, but does not include conventional breeding or traditional practices in use in any agriculture, poultry, dairy farming, animal husbandry or bee keeping.

Section 2(f) of the Biological Diversity Act, 2002

About the Board



Increasing concerns about dwindling biological resources led to the establishment and adoption of the Convention on Biological Diversity (CBD) which was negotiated and signed by nations at the 'Earth Summit' at Rio de Janeiro in Brazil on June 5, 1992. The CBD came into force on December 29, 1993 and India became a party to the convention on February 18, 1994. At present, there are as many as 193 countries which are parties to this Convention. This international Convention/CBD, for the first time recognized sovereign rights of the nations over their biological resources. Under the Convention, there are two protocols - Cartagena protocol (deals with bio-safety issues) and the Nagoya protocol (deals with Access and Benefit Sharing). Basically, there are three principles or 'pillars' of this Convention - firstly, the Conservation of Biodiversity; secondly, Sustainable use of its components and thirdly, Fair and equitable sharing of the benefits arising out of the use of biological resources.

India is one of the few mega biodiversity countries in the world and is also the signatory to the CBD. Taking cognizance of the provisions of the CBD, and to deal with the management of our biological resources, Government of India enacted the Biological Diversity Act, 2002. Subsequently, the Biological Diversity Rules were notified in 2004. The act is implemented through a three tier decentralized mechanism i.e. at the National, State and Local body level. The National Biodiversity Authority (NBA) has been established at the national level to implement the Act with its headquarters in Chennai (Tamil Nadu). The State Biodiversity Boards (SBBs) have been formed at state level and Biodiversity Management Committees (BMC) are being constituted at the level of local bodies for the implementation of the Act at the grass root level.

Guidance

Dr. Rakesh Shah

Direction

R.N. Jha

Editor

Dhananjay Prasad

Compiled by

Kunal Lal

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Dr. Rakesh Shah, Dhananjay
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Constitution of the Board

In accordance with the provisions of the said Act, the Government of Uttarakhand vide Notification No. 1773/x-2-2006-8(83)/2001 TC dated 22.03.2011 constituted the Uttarakhand Biodiversity Board. The Board was reconstituted in 2011 and again in 2013, vide 121(3)/X-3-2013-8(83)/2001 T.C. dated 14.02.2013.

The present Board comprises of a Chairperson, five ex-officio members and five expert members along with a member representing NGOs. The five ex-officio members include a nominee of PCCF, Uttarakhand; Director, Animal Husbandry; Director, Department of Agriculture; Director, Jan Jati Kalyan Department; Member Secretary, Uttarakhand Biodiversity Board. The five specialist members include Director, Herbal Research and Development Institute; Representative of Director, Wildlife Institute of India; Representative of Director, GBPIHED; Representative of Director, Botanical Survey of India and a Member nominated by the State Government of Uttarakhand.

Functions of the Board

The main functions of the Uttarakhand Biodiversity Board are:

- To advise the State Governments as per the guidelines issued by the Central Government on matters relating to conservation of biodiversity, sustainable use of its components and equitable sharing of the benefit arising out of the utilization of biological resources;
- To regulate by granting approvals or otherwise requests for commercial utilization or bio-survey and bio-utilization of any biological resource by Indians;
- To perform such other functions as necessary to carry out the provisions of this Act or as prescribed by the State Government.



FOR ANY COMMENT OR ENQUIRY PLEASE CONTACT

Uttarakhand Biodiversity Board

108, Phase II, Vasant Vihar, Dehradun - 248006

Telefax: 0135-2769886

E-mail: sbbuttarakhand@gmail.com, Website: <http://sbb.uk.gov.in/>

"Biodiversity Conservation - An art of living with nature"