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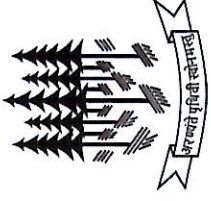
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ARANYAM



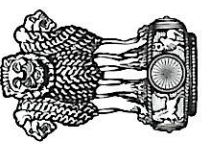
Government of India
Ministry of Environment, Forest & Climate Change
Central Academy For State Forest Service, Burnihat, Assam

Annual Magazine, 2017
XXI Issue

Government of India
Central Academy for State Forest Service
Burnihat, Assam
2016-17 Batch



First Row (l-r): 1. Tejas Chaudhary 2. H. Lalremnuata 3. Viralsinh Chavada 4. Shri C.A. Rahman IFS (Lecturer) 5. Shri M.K. Palit IFS (Rtd.) (Associate Faculty) 6. Shri Roshan Horo IFS (Principal) 7. Shri N.Luikham IFS (Lecturer) 8. Shri Ajay Rajak (PT & Game Instructor) 9. Rohit Chaudhary 10. Govind Chaudhary 11. Mayul Lamgu 12. Neelam Shumpi
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Not In Picture: Ram Wada Bagang



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Forest & Environment Department
Office of Principal Chief Conservator of Forest & Head of Forest Forces
Block A, 1st Floor, Aranya Bhavan,
Opp. St. Xavier's School, Sector - 10/A,
Gandhinagar, Gujarat - 382010



Kuldeep Goel, IFS
PCCF & HoFF, Gujarat

MESSAGE

Forest play an important role in sustaining life. Beside providing habitat for animals and livelihood for humans, forests provide numerous benefits which are essential for the survival. After oceans, forests are the world's largest storehouse of carbon and the ecosystem services provided by forests are critical to human welfare. Worldwide, over 2 billion people rely on forests for livelihood, shelter, water, food and fuel security.

The forest offers play significant role in sustainable management of forests. In today's scenario, they face lot many challenges such as climate change, deforestation, man-animal conflict etc. To perform such tasks appropriate training of the newly recruited foresters is essential. Central Academy for State Forest Service, Burnihat is a prestigious institute for training and grooming of the Range Forest Officers. It gives me immense satisfaction that Range Forest Officers from Gujarat State are getting training in this premium Institute.

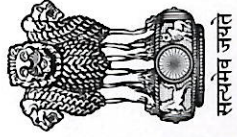
I am happy to learn that CASFOS, Burnihat is bringing magazine "ARANYAM" and I convey my best wishes on this occasion.

(Kuldeep Goel)

Dated: 22nd June, 2017
Place: Gandhinagar



Shri R. P. Singh, IFS
Director



सत्यमेव जयते

Govt. of India

Ministry of Environment, Forest & Climate Change

Directorate of Forest Education

PO: New Forest, Dehradun,

Uttarakhand - 248 006

MESSAGE

It gives me an immense pleasure to see that the 21st Issue of the magazine "Aranyam" is being brought out by CASFOS, Burnihat.

Forest Education in India aims at developing personae with all round development so as to deal effectively with the multifarious challenges in their field. Central Academy for State Forest Service, Burnihat, one of the oldest forest training institutions in the country, is certainly doing an excellent job in the field of forestry education by equipping the Officer Trainees with essential skills and attitude to strive for excellence in their sphere of operation. The alumni of this institution have brought great accolades to the institution as well as the state forest departments in the country.

The Forestry sector today has witnessed exceptional transitions during the last decade. This change has necessitated a change in the capacity expected out of modern foresters. Today, foresters need to possess a different set of skills which are very different and demanding, in sync with the transformation in societal conditions. The evolving needs have placed strong challenges on our training institutions. Despite the challenges, CASFOS, Burnihat has performed very impressively creating all round officers to serve the forests as well as the society.

This magazine gives us an indication of talents and capabilities of the Officer Trainees. Their other skills like writing, sports, cultural activities etc., are also brought to the fore by this venture.

I appreciate and commend the Principal, Faculty members, Officer Trainees and all those who are directly or indirectly linked with this venture for their painstaking efforts in bringing out this edition of the magazine in a brilliant fashion.

I wish every success for the Academy and the magazine.

Dated: 6th, July 2017

Place: Dehradun, Uttarakhand

(Shri R. P. Singh IFS)

Shri Roshan Horo, IFS

Principal

Central Academy for State Forest Service

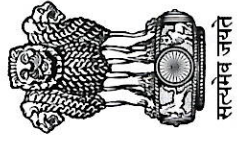
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Central Academy for State Forest Service

(MoEF&CC, Govt. of India)

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सत्यमेव जयते



From The Principal's Desk

An individual's talent, apart from academic training, can have a far-reaching influence on one's success. I am happy that the officer trainees of 2016-17 batch has surfaced their talent in a forum like ARANYAM and have kept up the tradition, of bringing out a magazine, of the academy. The magazine expresses the thoughts and knowledge of the trainees through articles, poems and photographs, harboring memories for whole life.

Today in the era of depleting natural resources, management, development and protection of such resources is a crucial task not only at regional but at a global level and the magazine like ARNYAM may play vital role for awareness generation and to sensitise people for the conservation of forests and wildlife.

The XXI issue of ARNYAM has been brought out on convocation of officer trainees 2016-17 batch. I wish all the passing out officer trainees a very exciting and successful carrier in their endeavor to further the cause of conserving the elements that are crucial for the sustainability of the mother earth.

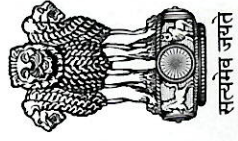
Dated: 23rd, June 2017

Place: Burnihat, Assam

(Roshan Horo)



Shri N. Luikham, IFS
CF & Lecturer



Central Academy for State Forest Service
(MoEF&CC, Govt. of India)
G.S. Road, 13th Mile, Burnihat, Assam - 793101
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Chief Editor's Note

Working for and witnessing the transformational outcome leading to responsive internal energy, enthusiasm and creativity keeping in perspective the responsibilities and opportunities that exist beyond the four walls of the Academy is one noble challenge and opportunity.

Shaping the raw talents of the officer trainees coming from various states of the country with varied backgrounds, temperaments and beautiful socio-cultural heritages is indeed a divine opportunity hard to be ignored.

The Range Officers of the 2016-17 Course has exhibited remarkable sense of discipline, dedication and purpose during their 18 months stay at CASFOS Burnihat. During the transformation process over this period they must have understood a lot more about the dynamics of how nature supports every life on earth based on some principles which need to be understood further for keeping the linkages of mother earth robust and healthy.

The articles appearing in this XXI issue of Aranyam are manifestations of some of their thought processes. At this stage of their career it is crucial to discover the latent talents and potentials within himself/herself. One of the critical ingredients during the rigours of transformation is to inculcate the spirit of understanding previous ideas, ways to improve on existing ideas and learning newer ideas on perpetual basis. Penning such understandings and ideas is a small beginning but an important step towards refining thought processes. Inconsistencies, lack of in-depth articulations or such other shortcomings in Aranyam may be ignored for the greater objective of at least initiating the habit of writing creatively.

I would like to thank the entire editorial team, my colleagues, the RFO trainees 2016-17 Course and all other contributors in bringing out the XXI issue of Aranyam.

Jai Hind

Dated: 20th, June 2017
Place: Burnihat, Assam


(N. Luikham)



Priyank Patel
Magazine Secretary
RFO Trainee, 2016-17 Batch

From the Editor's Corner

The Very purpose of bringing out magazines like this is to explore the hidden talents among the trainees who come from various parts of the country with different educational Qualification and cultural backgrounds. A part from this, the Magazine serves as a permanent document or record that may be used as a future reference.

It is rightly said that Rome was not built in a day that is to bring out our college magazine, "ARANYAM" (Vol. XXI), the trainees, teaching and non-teaching staff, put so much toil to whom, I extend my Sincere thanks.

For this work, the editorial board would like to acknowledge with profound gratitude to Principal of this Institute Shri. Roshan Horo IFS for granting the permission to carry out the work and all the necessary facilities provided for this work without any second thought.

We also express our deep sense of gratitude to Shri N. Luikham IFS whose vision was the guiding light to this work. We also offer our heartfelt thanks to Shri C.A. Raheman IFS for his empathetic approach, wise counseling, and constant encouragement during the work.

My thanks are due to Directorate of forest Education, Principal chief conservator of forest, Gujarat for their valuable messages to ranger trainees.

We are thankful to our adviser for their wholehearted co-operation and hope such co-operation will be extended by them in future years also. We are thankful to the office staff of this college for extending their help and co-operation who have worked together to mould the annual and also to CASFOS Association Members and All RFO Trainees 2016-17 batch operation in the getting magazine on the dais.

CASFOS ASSOCIATION



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Principal



N. Luikham, IFS
Lecturer



C. A. Rahaman, IFS
Lecturer



Ajay Rajak
P.T. & Game Instructor



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**Staff Members of Central Academy for State Forest Service,
Burnihat, Assam**



Central Academy for State Forest Service Association Members

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ANNUAL REPORT (2016-2017)

CASFOS Association Burnihat
Burnihat, Assam

Mr. Rohit Chaudhari

General Secretary
CASFOS Association Burnihat
Burnihat, Assam

On the occasion of releasing of Annual magazine I feel privileged to put forward the annual report of the year 2016-17 of the activities and achievements of the association. The objective of CASFOS Association is to maintain discipline and healthy environment in the hostel and the Academy and to look out all the needs of the trainees, help them to inculcate managerial and officer skills in themselves and to meet the requirements of the trainees regarding Mess, Hostel, Sports and Cultural events. I feel privileged to be part of the Association and to work for it which gives platform to each and every trainee to express themselves regarding any issue whether it is related to the Academy or outside world.

Objectives of the Association:

- (1) To maintain healthy environment in both Academy and Hostel.
- (2) To maintain discipline among the trainees.
- (3) To control and manage Mess and Hostel.
- (4) To control, encourage and promote all games and sports, literary and cultural activities in CASFOS and thereby to infuse a sense of camaraderie amongst the trainees.
- (5) To look after matters relating to study and health of the trainees.
- (6) Publication of annual magazine "ARANYAM".
- (7) To make, alter, amend, maintain and enforce rules and regulations for the control and governance of sports, cultural and academic activities.
- (8) To do all such other acts as may be conducive to carrying out the aims and objectives of CASFOS Association Burnihat.
- (9) To select different committees on need basis if necessary.

CASFOS Association:

The Principal CASFOS, Burnihat is the President of the association, who is over all in charge for day to day activities of the association.

General Body:

All the officer trainees are the members of the Association.

Executive Body:

Executive body consists of eight office bearers which are selected/ elected among the trainees through selection/voting.

For each Portfolio, the following trainees have been selected for the academic year 2016-2017.

Sl. No	Name	Designation
1.	Mr. Rohit Chaudhari	General Secretary
2.	Ms. Neelam Shumpi	Asst. General Secretary
3.	Mr. Priyank Patel	Magazine Secretary
4.	Ms. C.Laldanmawia	Treasurer
5.	Mr. Svapnil Patel	Mess Secretary
6.	Mr. Likha Obi	Hostel Secretary
7.	Mr. Govind Chaudhary	Cultural Secretary
8.	Mr. Lalthatamkima	Sports Secretary

ACTIVITIES DURING 2013-14

Range Forest Officer training for the batch of 2016-2017 commenced on 21st January 2016 and passing out is likely to take place on 21st July 2017. The issue of the magazine is being brought out at the time of convocation of batch 2016-2017. The present office bearers of the association assumed charge in July 2016. In this tenure of 1 year the Association reached many milestones.

Mr. Govind Chaudhary, Cultural Secretary

Understanding the culture of a nation, people, or group the art, belief, custom, practice, value and social behavior, is an essential part of the educational/ training program. Cultural events offer a glimpse of the diversity and the artistic expression found in a community. We find good scope of expanding our horizon and gain a unique insight into the community representing an area a state and a country as a whole. Keeping in view the cultural diversity of the trainees from different regions of the country, CASFOS Association grabbed the opportunity by organizing two major events and many small celebrations in due course. First event being the farewell night for our senior batch 2015-16 "Shoot for Moon" on dated 19th July 2017. This programme was attended by Director, Directorate of Forest Education, Dehradun, Principal and all Faculty members along with their family members and staff. This event only made bonding between both batches even stronger. Second event came as farewell night for our senior trainee batch, SFS titled "Voyager's Paradise" on 4th April 2014. The event was decorated with mesmerizing performance from both the batches.

It served as platform for local children to expressed talent of their group called Green image and also provide platform for immersing talent of students of University of Science and Technology, Meghalaya.

Mr. Obi Likha, Hostel Secretary

The quality of hostel is an essential part of the academic success. CASFOS provides standard Hostel on-campus separate BLOCK A-30 rooms & B-30 rooms for Officer Trainees with excellent amenities for comfortable living of the trainees. Hostel all rooms having attached toilets with GEYSER facilities are available to provide Guest room including visitors of VVIP and refresher

course inside the CASFOS Training campus.

The hostels are provided with 24 hour water supply, uninterrupted power supply, internet facilities is under processes, TV, Refrigerator, Aquaguard, Magazines, Newspapers, outdoor games Like Badminton courts for Seniors & Juniors, football ground, volleyball ground and newly constructed lawn Tennis court. For fitness zym hall is attached in hostel.

The hostel also has a common room for reading newspaper and watching TV where the Training can interact with each other which is very much essential for professional training education. Food in the hostel is served in the mess. Both non-vegetarian & vegetarian food is available on the basis of requirement of the trainees which is run by Trainees. Good hygienic condition is strictly maintained both in the food and living conditions. Principal and course director supervise the functioning of the Hostels regularly.

Mr. Svapnil Patel, Mess Secretary

A nutritive proteinaceous balanced diet is crucial need for both physical and mental health of a mankind. To maintain the overall healthy condition and hygiene a balanced diet has been provided. During my tenure to provide better service to all the trainees and for smooth running of mess many sets of utensils like new steel plates, bowls, water cups, tea cups, spoons, and forks were issued from the stock. Also fibre plates, steel jugs and banquet catering utensils were purchased during my tenure to serve the trainees well. Digital weighing machine has been used in mess to ensure transparency for issuance of stock in mess. I personally thank respected principal sir for this.

Lady mess worker has been appointed thus maintaining the gender balance in the mess. By utilizing the mess workers welfare fund one pair of green color uniform, one sweater, one T-shirt, one pair of shoes and an apron to each worker has been provided. Besides financial assistance was provided during New Year celebration, Holi, Bihu festival, Eid, Durga puja and also during the medical emergency of the workers. This is not only but also financial help was given for smooth running of the RD accounts of the mess workers.

Mr. Lalthafamkima, Sports Secretary

We all know the importance and essential of sport in our daily life, so in the schedule of our training, the classroom education and physical education go hand in hand. As a Range Officer, having good knowledge about the forest and its management but lacking physical fitness is incomplete. So the main aimed of these 18 months Ranger Training is to achieve both knowledge about the forest of India and to maintain physical fitness.

In order to get this physical fitness, we have PT&GI instructor who guide us throughout the training course. Every morning except Saturday and Sunday we have Personal training in our ground. The duration of the training is generally one hour. During this period we do physical exercise under the guidance of our PT instructor for half an hour and we spend another half hour for Yoga class. Every Friday, trekking was done in CASFOS campus of the Meghalaya side, here there's a small patch of forest which is helpful for refreshing our mental health.

In the evening after class we have games period of one hour. During this, the trainees play different kinds of game like- Football, volleyball, basketball, and cricket.

Last year we had a memorable sport week with our Senior's which was very exciting and full of enjoyment but, this year as we are only single batch and less in number we couldn't have organized sport week. Nevertheless the excitement and passion of the sport remains with us, everyday during games and post game period we played. Volleyball and badminton are the two games regularly played which help us in maintaining physical fitness.

Our Academy had contributed players for AIFSM (All India Forest Sport Meet) in the past years. This year we have three RFO Trainees from our Batch participating in AIFSM, along with ACF 2016-18 Batch they represent DFE (Directorate of Forest Education) Football Team. The sport meet was held at Hyderabad, during 07/01/2017 to 11/01/2017.

Good sport infrastructure and facilities are very important to develop the trainees. So our

Academy is trying their best to provide sport facilities to meet the daily requirement of the trainees. For this, new infrastructure is coming up and the present facilities are also well maintained. As of now, these are the facilities we have in our Academy-

- 1) Football ground
- 2) Volleyball court
- 3) Basketball court
- 4) Badminton court
- 5) Table tennis
- 6) Gym (Recently Upgraded)
- 7) Tennis Court (Ongoing work)

Since our Batch is from three States (Gujarat, Mizoram and Arunachal Pradesh) we are different from each other in many ways like language, food, age, background etc, but when it comes to sport there's no different among us, we act as a team. Sport has the power to cross divides like no other form of entertainment. Sport speaks no language, has no race and no creed or culture. Sport can unite people from different backgrounds, classes, ages and countries; this is the magic of sport. According to me, the best and most beautiful part of our training is the moment we get team spirit and unity due to sports.

Mr. Laldanmawia, Treasurer Secretary

CASFOS Association has been running since long years ago. Since the inception till date, the association has been performing a remarkable duty and works for the smooth running of the association in favor of all the trainees. This includes maintaining a holistic environment in the campus within the ambit of the Academy, hostel and other places. Being a treasurer of this association for the year 2016-2017, I felt privileged enough for making a meager contribution for the whole shake regarding maintenance of accounts, cashbook and other financial related matters. Right from the scratch, CASFOS Association had opened a joint account at United Bank of India (UBI), Burnihat. From that time the account has been functioning till date and has been passing on from one batch to the next year by year.

The money in this account comes from the time of farewell, all other activities and functions Association fund collected from every trainee, that wherein the association takes the opportunity to organize within the ambit of its jurisdiction.

Lastly, the annual account along with all other details is again used to be put under the final audit by the faculty in charge of the association prior to closing of the account.

FAREWELLS AND WELCOMES

During past one year CASFOS Association gave splendid farewell to two faculty members Sh. Pallav Kumar Deka, AFS and Sh. M. Barua, AFS in January 2014 after completion of their tenure in the Academy. At the same time Association had privilege to host and welcome number of guest lecturers in the Academy who imparted their valuable knowledge to the trainees.

The accumulated amount in the treasury is used to be utilized for the whole benefit of the members in organizing functions such as religious festival celebration, cultural night organizing at the

With Best wishes

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Cultural Landscapes as Conservation Units: Majuli (Assam)

Monika Koul
Assistant Professor
Department of Botany
University of Delhi, Delhi-110007

As the world recognized the importance of biological diversity and the threats it is facing all across the globe, conservation of biological diversity and sustainable use of its components came into the limelight and attracted lot of attention. In the year 1992 (Earth Summit at Rio de Janeiro) sustainable use of biological resources was discussed and deliberated upon on an international platform for the first time. In 1993, UNEP (United Nations Environment Programme) identified conservation of biodiversity as a priority. Many *in situ* and *ex situ* strategies were formulated and designed to suit the requirements and the threats to which the species is subjected. A unique strategy that came into force is setting up and designating cultural landscapes as conservation units.

Introduction

A Cultural Landscape has been defined as a geographic area, including both cultural and natural resources in it. Cultural Landscapes provide a sense of place and identity; they map our relationship with the land over time; and they are part of our national heritage. According to the definition given by social scientists, these are sites associated with a significant event, activity, person or group of people and range in size from thousands of acres of rural land to historic homesteads. They are diverse in nature and can be grand estates, farmlands, public gardens and parks, college campuses, cemeteries, scenic highways, and industrial sites as per biologists. According to historians and philosophers, these are works of art, narratives of cultures, and expressions of regional identity associated with a historic event, activity, or person, or that exhibit other cultural or aesthetic values. Lot of

work is being carried out these days to conserve and preserve the rare, endangered and threatened species in these landscapes and also to conserve these cultural landscapes in totality. Sometimes cultural landscapes are confused with sacred landscapes. However, there is a sharp distinction between the two in terms of the ethics and basis on which the species are conserved in these units. Some ecologists and anthropologists have used these as synonyms.

The United Nations Educational Scientific and Cultural Organization (UNESCO), an international consortium of approximately two hundred countries has the mandate to maintain a World Heritage List.

The list includes sites that possess "outstanding universal value" in a global context. Countries that are signatories to the Convention Concerning the protection of the World Cultural and Natural Heritage (1972) can nominate any new site that falls into the cultural landscape category for inclusion in the list. In December 1992, a new committee was set up to work in protection of cultural landscapes and named as the World Heritage Committee. This committee recognized cultural landscapes as a category of sites within the Convention's Operational Guidelines, and by 2002, thirty World Heritage cultural landscapes had been officially recognized as landscapes of value.

Types of Cultural Landscapes

The cultural landscapes have been divided into four categories and each category is further divided into sub-categories. The categories included are as

preservation, rehabilitation and restoration. The Indian traditional perception of culture and its resources is based on the fact that culture is integral part of the living fabric of society. Indian Cultural Landscape (ICL) can be called 'intellectual landscape', a collection of religious, cultural and physical meanings ascribed to geographical components through collective memory, planted on the ground in active engagement of communities over generations, empowering nature and land from physical to the metaphysical. The ICL is a repository of various components of the landscape.

Manjuli (Assam): An interesting cultural Landscape

Majuli is one of the largest inhabited mid river deltaic islands. It is located in the upper reaches of the river Brahmaputra and within the latitude of 26 45'N-27 12'N and longitude of 93 39'E-94 35'E. Majuli was created as a result of periodical natural changes in the course of the river Brahmaputra caused by frequent major earthquakes in different times as well as high floods.

Majuli is situated in the northern part of Jorhat District separated from the main land by the river Brahmaputra. Its geographical area was nearly 1256 square kilometers as per Government survey of 1891 but much of it was washed away by the river Brahmaputra. Now the area is shrunk to not more than 515 square kilometers. Human habitation in Majuli started from the period when the agrarian people were in search of conducive and fertile soil. Majuli's land mass was regularly inundated by floods spreading sediments to its soil which made it suitable for growing paddy, mustard, sugarcane, pulses, jutes, garlics, potatoes and other essential goods. For existence of innumerable beels, wetlands, inactive river channels and sparsely scattered population, the entire Majuli's land area did not come to the notice of the settlers. Most of these were occupied by wild birds and animals. As per the land survey records of 1950 the total habitable landmass was 1245.12 sq. kms. Mysteriously the number of its

Cultural Landscapes: India context

Many such landscapes have been recognized in India as well as round the globe and these designated areas are helping in

(i) Historic sites: A landscape significant for its association with a historic event activity, or person. Examples include battlefields and official house properties.

(ii) Historic designed landscapes: A landscape significant as a design or work of art; was consciously designed and laid out either by a master gardener, landscape architect, or horticulturist to a design principle, or by an owner or other amateur according to a recognized style or tradition; has a historical association with a significant person, trend, or movement in landscape gardening or architecture, or a significant relationship to the theory or practice of landscape architecture. Examples include parks, campuses, and estates.

(iii) Historic vernacular landscapes: A landscape that evolved through use by the people whose activities or occupancy shaped that landscape. Through social or cultural attitudes of an individual, family or a community, the landscape reflects the physical, biological, and cultural features reflect the customs and everyday lives of people. Function plays a significant role in vernacular landscapes. They can be a single property such as a farm or a collection of properties such as a district of historic farms along a river valley. Examples include rural villages, industrial complexes, and agricultural landscapes.

(iv) Ethnographic landscapes: A landscape containing a variety of natural and cultural resources that associated people define as heritage resources. Examples are contemporary settlements, religious sacred sites and massive geological structures. Small plant communities, animals, subsistence and ceremonial grounds are often components.



population is increasing more than 1.35 lakhs during the post independent decades in Majuli.

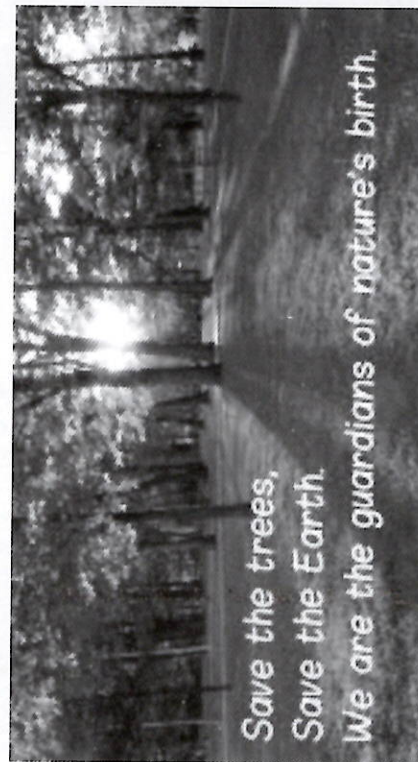
However, the increase the population, anthropogenic interference, tourism and over-exploitation of the resources created lots of problems in this interesting ecological zone. Majuli Cultural Landscape Management Authority (MCLMA) a statutory body was constituted under the provision of the Majuli Cultural Landscape Region (MCLR) Act 2006 to take care of the area and manage the resources. The Act came into effect through Government Notification dated 27/07/2006. The Act has mandated the Majuli Cultural Landscape Management Authority to integrate development and heritage for protection of heritage resources of MCLR through education, awareness, understanding of cultural significance and ensuring a sustainable and positive development trend. The Act essentially is a legal framework for conservation of culture and heritage of Majulisland with a focused development initiative, making provision for a core area and buffer area.

The core area means the water and landmass of Majuli sub-division while buffer area means the landmass around core area along both sides of Majuli sub-division. After this intervention and setting of protected areas, marsh vegetation, bamboos and canes have been conserved. The Majuli has a wide variety of trees, shrubs, creepers, palms, bamboos, ferns, aquatic plants, grasses, cactus etc. Many of these are economically and ecologically

important species. Due to conservation of plants, the faunal species have been taken off on its own. Funds are available in plenty to restore the species that are not available in abundance. Thus, this landscape is preserved and species are conserved for larger good.

Conclusions

Though cultural landscapes play an important role in conservation and preservation of unique geographical and cultural sites, yet there importance is not overemphasized. The concept is still new and many people are not clear about the rules for setting up these landscapes. There is no clarity on the role of various departments in protection of these. Forest Divisions are not ready to undertake the ownership as they are already burdened with lot of work. However, it is important to understand that protection and management of the Indian cultural landscapes is important challenge that needs to be effectively addressed by the mainstream through long-term collective commitment of the official agencies and institutions. There is an immediate need to develop context and resource specific tools for developing and managing the landscape site. It is our national responsibility to comply with international directives and work protection of our cultural sites and preserve these till eternity. Thus, we can save many resources and guard these so that enough is there for future. As man is at the epicenter in the context, the cultural heritage along with social set up in these areas will also be protected.



Aiting (Mantisia spathulata)- A Critically Endangered and Endemic Species of Mizoram.

C. Laldanmawia
RFO Trainee, 2016-17 Batch

Mizoram is bestowed with a great diversity of plants. A small pocket of forest in the southern region is one of the most prestigious plants called 'Aiting'. 'Aiting' is the local name of Mantisia spathulata in Mizoram, which is found blooming in their natural habitat during the month of May on hills along the roadside of Lunglei, Mizoram. This unique common name of the flower 'Dancing Girl' was given because looking at a single flower carefully; the yellow corolla looks like a girl and the two stamens resemble the two outstretched arms of a dancing girl. The seed is collected and collection can be done in the early monsoon from the native area. It has been observed that the capsule dehisce immediately after the seed formation but no new seedlings are found in the area. This may prove that regeneration in natural area is not so successful. So, this indicates that it is proper conservation afford and management. The species is critically endangered ornamental plant and endemic to small pocket Mizoram.



1) 'Aiting' flower, looking like a dancing girl.



2) 'Aiting Plant' one of the species of Zingiberaceae

One of the interesting discoveries of 'Aiting' plant other than the previous location is Kolasib division, Mizoram. Since, this species was earlier typically found only in the rocky hills of Lunglei in Mizoram at an altitude of 1,200 – 1,500 meters. But the recent discover of this plant in Kolasib Division proves that the plant has some other areas of distribution within the state. It was spotted at a lower altitude of 662 meters at Kolasib in Mizoram. This was observed by scientists Aparajita De and Demsai Reang of ecology and environmental science department, Assam University, Silchar.

It is said that the species has become endangered due to several natural calamities since the ecosystem of the area is affected mostly by landslide and shifting cultivation. The other special features of the species includes the fact that it grows in bare rocky areas and it is not found in dense patches because it requires a minimum amount of sunlight and shade to flourish. It is included in the national priority list for recovery and conservation by the department of biotechnology, New Delhi, under the ministry of science and technology.

Conservation and restoration of unique vegetation and ecosystem of Dancing girl: Due to the importance of this endemic plant and its condition of being critically endangered, Lunglei Forest Division has taken up some measures to restore the unique ecosystem of this plant by directing some of the conservative measures. This includes, management strategies such as survey and inventory of this unique vegetation,

including their sampling and enumeration. These are incorporated in the working plan and accordingly direct the prescription. Other measures includes, communication to carry out management such as construction of trekking path/ inspection path, approach road, fire line cutting, fencing, erection of watch tower, and enrichment planting augmented by weeding. Apart from this, research on documentation of unique species in booklet form was also done.

Constraint: Before the conservation and restoration measure was taken up, the major constraint in the area was shifting cultivation which had been prevalent in the area. The slash and burnt cultivation technique, slope failure and erosion cause deleterious effect in this plant population and its ecosystem well.

Since this plant is unique and endemic to the states, it represents a prestigious ecosystem. So, a conservation measure is needed to be directed for the long-term sustainability and existence of the species.

Reference:

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A pond equals ten wells, a reservoir
equals ten ponds.
A son equals ten reservoirs, and a tree
equals ten sons!

दशकूपसमा वापी दशवापीसमो ह्रदः ।

दशह्रदसमः पुत्रो दशपुत्रसमो द्रुमः ॥

dasha-kūpa-samā vāpī, dasha-vāpī-samo
hradaḥ ।

dasha-hrada-samaḥ putro, dasha-putra-
samo drumah ॥

Matsya-purāṇa 154:512

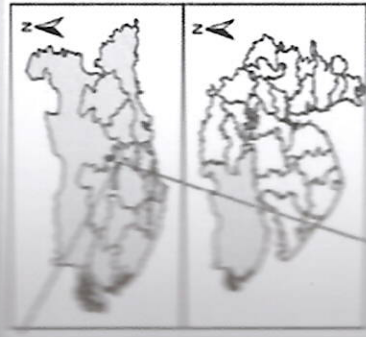
Shravan Kavadia, Kachchh, Gujarat - A Rare Sacred Inland Mangrove Site

Rahul Kumar M. Patel
RFO Trainee, 2016-17 Batch

Traditional conservation of forests through sacred groves in India has been practiced since very long. Sacred groves are the forest patches protected by a community for their religious beliefs. These forest patches are restricted for logging and hunting. There are more than 13,900 sacred groves recorded in India. However, mangrove sacred groves are very rare in India.

Among the inland mangrove communities, *Avicennia marina* represents the only sacred grove species of the world's inland mangroves. It occurs in fringing to intermediate tidal zone, but the sacred grove of the mangrove in Shravan Kavadia, Kachchh is in a totally land-locked position and having no surface connection to the sea and dependent on underground supply of saline water, which in turn is dependent on the annual influx from the sea.

It is located near the famous temple of Shravan Kavadia, a Hindu pilgrimage site near Kuneria village which is about 40 km in the north east direction of Bhuj city on the fringes of Banni grassland area of Kachchh district of Gujarat.



(Location map of Shravan Kavadia)



(*Avicennia marina*)
(Photos taken from the internet)

Kachchh district of Gujarat represents ecologically one of the most fragile and peculiar desert arid ecosystems. It has extensive mudflats and home of mangroves, which represent the phylogenetically unrelated groups of plant species that thrive along tropical and subtropical coastlines and are adapted to tolerate saline environments in the intertidal zone.

Geological Ambiguity of Shravan Kavadia:-

In very ancient time, the Rann of Kachchh was a shallow sea, which dried up with the uplifting of land due to tectonic shift. The drying and uplifting of the land led to disconnection of this mangrove area from the sea and created a landlocked condition for the mangroves. Therefore, the surviving mangrove patch in Shravan Kavadia belongs to one of the ancient bio-genetic pools.

This unique stand of inland mangroves is about a kilometer inside the forest of *Prosopis juliflora*, *Salvadora persica*, *Salvadora oleoides* and its associate species.

The salinity is highly variable with depth of the soil and pH is as high as 8.5. The water is highly saline, thus, not suitable for irrigation or drinking purposes. Further, high silt and clay contents lessen the vertical and lateral movement of surface and subsurface water. Also most of the area falls under very slow to slow permeability, which subsequently leads to water logging in the low-lying areas during good rainfall years. The soil moisture is extremely low during summer season.

Threats to Inland Mangroves site:-

Natural calamities:

Two decades ago, there were around 80 adult trees in a dense patch. Unfortunately, half of the trees were destroyed during the 1998 cyclone. It had been reported the survival of about 33 trees after the cyclone, which also included the partially damaged or top-broken trees.

Reduction of fresh water and tidal water flows:

Decreased rainfall, increased temperature and evaporation had led to increased salinity, which may turn in decreased seedling survival, growth and net primary productivity of Mangroves. Mangrove area is reduced because of the conversion of land into a hyper saline flat. The mammoth stand of *Avicennia mangroves* in this area depends mainly on an underground supply of saline water from the sea. Any road/embankment construction may impede this influx of water and may have unknown effect on the mangrove.

Invasive species:

The survival risk of the sacred grove species is further aggravated and triggered by the invading alien species, *Prosopis juliflora*. It requires 3-4 times more water to produce a unit of dry matter as do native perennial grasses. Hence, it might have worsened the soil moisture condition, affecting the inland mangrove patch.

Climate change:

Climate change is one of the most important environmental issues impacting mangroves. It results in increase in temperatures, rising sea level, frequency of tropical storms and tsunamis.

Prone to Pest Attack:

Few standing trees infested with wood-boring insects on the stems and branches with deteriorating tree growth causes threat to this endemic inland mangrove species.

Religious Attachment of local people and Efforts towards conservation of the unique site:-

The inland mangrove in Shravan Kavadia is one of the most important sacred grooves for the local inhabitants and since long, fire, harvesting, logging or collection of fire wood have been totally prohibited and considered religiously inauspicious by the local inhabitants with belief that "they can not take the wood for personal use of this sacred mangroves otherwise the deity will curse them" is helpful for the sustainable development of the area. It seems community is conserving and protecting the entire patch of inland mangroves as a sacred tree grove.

There is a proposal to declare this unique mangrove site as a Biodiversity Heritage Site (BHS) of the state by Gujarat State Biodiversity Board and are in process of initiating research and necessary formalities.

Clear barbed wire fencing and ban imposed in collection of any biomass from this stand is also helpful to protect the patch from any sort of human induced interference.

Conclusion:-

By identifying Shravan Kavadia of Kachchh as a biodiversity heritage site helps towards the scientific research of the site and implementation of a management plan to conserve it with the help of locals and among others. Also, *in situ* or *ex situ* conservation approach could also help to protect and restore this *Avicennia* mangrove with the help of local Forest Department, government and non-government organizations.

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Bamboo Flowering & its Consequences in Mizoram

Lalrindika Khiangte
RFO Trainee, 2016-17 Batch

Bamboo Flowering (locally known as Mautam) is a cyclic ecological phenomenon that occurs every 48-50 years in NE India states of Mizoram. A bamboo species responsible for this is known to be of *Melocanna baccifera* which is mostly found species within the state. One of its stages involves a Rat Boom, which in turn creates a widespread famine in those areas.

Mautam- A Famine Causal:

A bamboo species *M. baccifera* flowers at one time across wide areas (gregarious flowering) when the predicted flowering times comes. Soon after flowering the bamboo dies and regenerates from seeds, and rodents' outbreak happened accordingly. This rodent's feast on this seeds which are available in plenty leading to rat boom.

Experts believed that the flower has a positive effect on the fertilization of rats as well as on increasing the viable size of rat litter but there was no scientific prove yet. All available explanations point to the fact that the increase in their numbers during the peak year is a natural after effect of the flowering of bamboos. However once they exhaust this temporarily abundant food supply, the rats turn their attention to the cultivated crops on which local people are dependent. And thus causing devastating Famine.

Political History of Mautam in Mizoram:

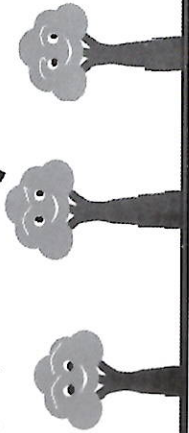
Mizoram suffered Famine in 1862 and then subsequently in 1911. In both the cases, the records strongly suggest that the bamboo flowering leads to a dramatic increase in local rat population. The drastic increase led the rats to raid on granaries which causes destruction of paddy fields and subsequently to a yearlong famine.

This famine thus played a significant role in shaping the region's political history. During 1958-59, Mautam happened again and resulted in recorded death of at least hundred people, besides heavy loss to crops and human property. The elderly villagers have claimed that their warnings based on folk traditions were dismissed as Superstition by the Govt. of Assam, which then ruled what is now the State of Mizoram.

The negligence by the Govt. led to the foundation of Mizo National Famine Front, which was set up to provide relief to the far flung affected areas. This body later became the Mizo National Front (MNF), and staged a major uprising in 1966. The party under the Leadership of Mr. Laldenga (Ex CM of Mizoram) fought a bitter separatism struggle for twenty years against Indian Army until an accord that guaranteed Mizoram's autonomy as a separate State was signed in 1986. Thus the famine leads to the Statehood.

पेड़ - पौधे मत करो नष्ट,

साँस लेने में होगा कष्ट.



Bugun Liocichla an Endemic Bird Species of Eaglenest Wildlife Sanctuary (A.P)

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Arunachal Pradesh

Bugun *liocichla* (*Liocichla bugunurum*) is a passerine bird species from the Leiotheichidae family closely related to the Emei Shan Liocichla. This small bird is described as a type of babbler, a diverse family of bird that usually live in tropical forest.

Bugun Liocichla is one of the endangered species of bird. It was first discovered in 1995 at Eaglenest Wildlife Sanctuary and later in 2006 it was described as a new species by Ramana Athya. The scientific and common name is derived from Bugun tribe a native people who live on the edge of the sanctuary and in whose communal forest the species was discovered.

DESCRIPTION:-

This beautiful bird of 22cm (8.7inch) is olive-grey plumage and a black cap. The face is marked with prominent orange-yellow lore's, and the wings have yellow, red and white patches. The tail covers the red tips. The feet are pink and bill is black at the face fading to pale white. Their fluty voice is distinct among all birds in the forest.

DESTRIBUTION:-

BugunLiocichla is found in small pockets in the Eaglenest Wildlife Sanctuary of Arunachal Pradesh in the undisturbed zones of forest and on the hills terrains. They are distributed at an altitude of 2000m (6.600ft) on hill side covered with shrubs and small trees. They live in territory similar to that of the Emei Shan Liocichla. Small flock are observed during the month of January where as pair were observed in May with an estimated total of 14 individual.



THREATS:-

Logging for fuel-wood and timber extraction cause to the reduction of Bugun Liocichla. Another major threat is also the uncontrolled forest fire which affects large area which reduces the suitable habitat of this species. This small population is also considered threatened, especially in the light of plans to build a highway through an area though to be its primary habitat.

CONCLUSION:-

Bugun Liocichla is only currently known from one location and is not a migratory bird. Liocichla has brought fame to Eaglenest. Population may be discovered in other area of Arunachal Pradesh or neighbouring country Bhutan. The begun tribe help forest department in conservation activities and community development. The absence of any settlement inside forest has minimized any problem of hunting.



Endemic flowering plant species of Gujarat

Bhargav Brahmhbhatt
RFO Trainee, 2016-17 Batch

Introduction:

Variety of life on the Earth and its biological diversity is commonly referred as Biodiversity. India ranks sixth among the 12 mega-biodiversity centers of the world and it is the home for an unusually large number of endemic species. Nature has endowed India with a rich biological diversity, which includes over 40,000 species of plants and 75,000 species of animals. India has about 12% of the global plant wealth amongst which there are nearly 3000 tree species. However, nearly a third of the total plant species of India are endemic (Negi, 1993). Endemism is the confinement of a particular species, genus or groups of plants and animals in a particular habitat or region. Present article describes the endemic flowering plants of Gujarat listed by BSI.



Arthraxon lancifolius (Trin.) Hochst.

Family: Poaceae

Distribution: the species has been also reported also from the Indian state of Kerala. BSI reports the species as endemic in Gujarat.



Canscora diffusa (vahl) R.Br. ex Roem. & Schult.
Family: Gentianaceae

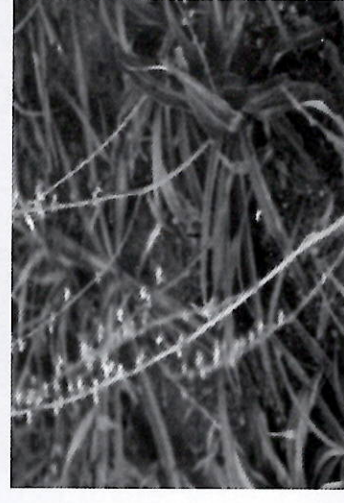
Distribution: Recorded in Karnataka, Maharashtra and Gujarat. In Marathi its known as Kilvar and Bhuin hem.



1. *Ceropogia odorata* Nimmo

Family: Apocynaceae

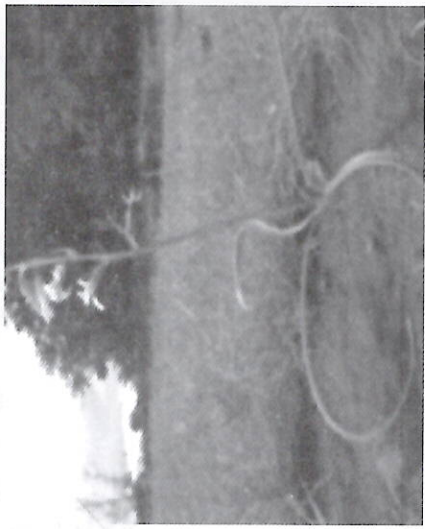
Distribution: Gujarat and Maharashtra
The species has been so far reported from the forest near Pavagadh region locally known as Jeemikand. The species is critically endangered.



4. *Chlorophytum bharuchae* Ansari, Sunararagh. & Hemadri

Family: Asparagaceae

Distribution:
Maharashtra, Gujarat
Reported in Indian Forester 96:304, 1970



5. *Dipcadi ursulae* Blatt. var. *longiracemosa* Deb & S. Dasgupta
Family: Asparagaceae



6. *Fuirena tuwensis* M. B. Deshp & Shah
Family: Cyperaceae
Distribution: Endemic to Western Ghats
IUCN status: Least concerned, as there are less threats.



1. *Helichrysum kutchicum* (C.B. Clarke) R. S. Rao & Deshp
Family: Asteraceae
Distribution: coastal region of Kutch and Saurashtra, Gujarat



1. *Hyphaene dicotoma* L.
Family: Arecaceae
Distribution: found in coastal areas of South Gujarat.



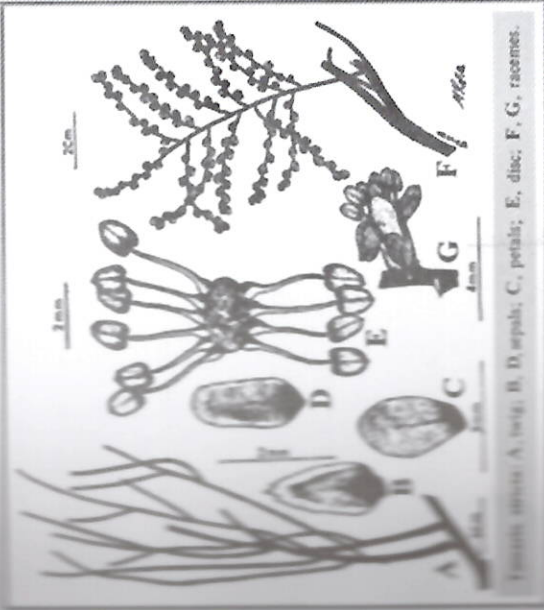
1. *Hyphaene thebeica* (L.) Mart
Family: Arecaceae
Distribution: In Saurashtra region



1. *Pycreus dwarkensis* (K.C. Sahni & H.B. Naithani) S.S. Hooper
Distribution: India (Gujarat), Oman, Pakistan and Somalia.
Highly fragmented population
IUCN status:



1. *Sesbania concolor* J.B. Gillett
Family: Leguminosae
Distribution: specimen have been collected from only 6 places, In Gujarat found in cultivated fields, Kutch. Also found in Yaman and Pakistan.



1. *Tamarix stricta* Boiss
Family: Tamaricaceae
Distribution: Coastal areas of Saurashtra.



1. *Tephrosia jamnagarensis* Santapau
Family: Papilionaceae
Only found in a grassland in the Saurashtra region



1. *Viola cinerea* Boiss. var. *Stocksii* (Boiss.) W. Becker
forma *Kathlawarensis*.
Its distribution in India was reported in the states Punjab, Rajasthan and Gujarat. extended to Pakistan, Afghanistan and Iran.

Conclusion: The botanical survey of India keeps updating the status of different plant species and their respective categories. Many of the species mentioned as endemic were reported to have distribution in greater extent, while some are typically endemic to particular region only. Out of 17 endemic species of Gujarat listed by BSI, three species viz. *Solanum purpureolineatum* Sabnis & Bhatt.of (*Solanaceae*) is an unaccepted name, while *Tamarix kutchensis* B.V. Shetty and R.P. Pandey (*Tamaricaceae*) and *Psilostachys sericea* Hook.f. (*Amaranthaceae*) are recognized as unresolved taxa.

Note: some of the photographs may not exactly resemble the taxon as are net origin and not verified.

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What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another.
Mahatma Gandhi

Forest Health Indicator

-: Forest Diversity :-

Parimal Patel
RFO Trainee, 2016-17 Batch

A healthy forest includes a variety of different plants and animals. One way to assess this diversity is to determine whether there is a mix of plant species of different sizes and ages, thus creating forest "layers" that provide habitat for many species.

Materials

Pencil, paper, tape measure, chalk, tree identification guide (optional)

Method

Look at the leaves, bark, seed pods, or flowers of the trees in your forest plot to determine whether they are the same or different species. Use the *Tree Species Diversity* chart below to catalog this information. Tree identification guides are helpful with this step, but not necessary. If a tree identification guide is not available, use your observation skills to describe the differences in tree types and include this information in the *Tree Species Diversity* chart below.

Measure (or estimate) the diameter at breast height (DBH) for all trees in the sample plot. Count (or estimate) the number of trees of different size classes using the corresponding DBH size classifications found in the *Size Diversity* chart below and record your findings. To help you, consider using chalk to mark the trees you have already counted.

Assess the presence or absence of different forest layers, using the descriptions found in the *Forest Layer Diversity* chart and record your findings.

METHODOLOGY

- To determine tree species diversity
A sample plot may be selected. The size may be of any convenient size depending upon the experiment. Within this sample plot, the trees species are counted with their reflecting numbers. Accordingly if is recorded as species 1, 2, 3,....., after this the name of their species will be given and their numbers will be recorded. (table-1)
- To determine size diversity
The species within the plot are measured at DBH and accordingly classified into sapling, small, medium, large and giant. Their respective numbers of the started categories are also recorded in the table-2
- To determine forest layer diversity
The sample plot data is categorized into different stories vise Overstory, Understory, Tall shrub, Short shrub, Forb, Leaf litter with their description. Then if there are present in the sample plot, the category in which if is present should be mentioned in table-3

Rating:

In order to give rating for the tree species diversity aspect, our sample plot can be rated as Good, if 3 or more tree species are present and given 3 points and Fair, if 2 species are present and given 2 points and vice versa.

For size diversity aspect, the sample plot can be again categorized into Good, if 3 or more size classes present and given 3 points and Fair when two size classes present and given 2 points and so on.

For forest layer diversity aspect, the sample plot can be again classified into Good, when 5 or 6 layers present and given 3 points, Fair when 3 or 4 layers present and given 2 points and so on.

Results

Species-1	Name or Description	Number found in sample plot
Species-2		
Species-3		

Note: Please continue listing to account for all species present in sample plot.

1) Size Diversity

Tree Size	DBH	Number found in sample plot
Sapling or Poll	4-9 inches (10-24 cm)	
Small	10-14 inches (25-37 cm)	
medium	15-19 inches (38-49 cm)	
large	20-29 inches (50-75 cm)	
giant	30 inches or greater (> 75 cm)	

2) Forest Layers Diversity

Tree Layer	Description	Present in sample plot? (Yes/ No)
Overstory	Trees whose canopies are fully exposed to the sun	
Understory	Trees growing in the shade of other trees	
Tall shrub	Shrubs (woody plants with several stems arising from the base)	
Short shrub	greater than 6 feet (1.8 meters) in height	
Forb	shrubs less than 6 feet (1.8 meters) in height	
Leaf litter	herbaceous (non-woody) plants such as ferns, wildflowers, and grasses	
	Dead and decaying leaves and other matter on the forest floor	

Rating

1) Tree Species Diversity

Rating	Description	Points
GOOD	Three or more tree species present	3
FAIR	Two tree species present	2
POOR	One tree species present	1

Tree Species Diversity rating for sample plot: (Value A)

2) Size Diversity

Rating	Description	Points
GOOD	Three or more size classes present	3
FAIR	Two or size classes present	2

3) Forest Layers Diversity

Rating	Description	Points
GOOD	Five or six layers present	3
FAIR	Three or four layers present	2
POOR	One or two layers present	1
Forest Layer Diversity rating for sample plot: (Value C)		

Overall Rating

Determine the overall rating by adding up the points shown for the tree species, size, and forest layer diversity ratings; then dividing the total by 3. Round the total to the nearest whole number. (Value A + Value B + Value C) 3 = _____ (Average point value)

Overall rating for Forest Diversity:

Good: Average point value of 3 Fair: Average point value of 2 Poor: Average point value of 1

Overall Forest Diversity rating for sample plot: _____

(Sources

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निर्वनो वध्यते व्याघ्रो निर्व्याघ्रो
छिद्यते वनम् ।
तस्माद्व्याघ्रो वनं रक्षेत् वनं व्याघ्रं
च पालयेत् ॥

- महाभारत, उद्योग

Meaning: Without the forest, the tiger can not survive. Without the tiger in the forest, the forest will get destroyed (by the people). Hence the tiger must protect the forest and forest must protect the tiger (and other animals)

- Mahabharatha, Udyoga

Law's of Personality Development

Nabam Takam
RFO Trainee, 2016-17 Batch

The development of one's personality, done in the right manner, is a challenging and rewarding task for every individual, particularly for the energetic youth who can gain much from it. It is challenging in that it demands hard, methodical labor, perseverance and careful attention. And it is rewarding since no effort in this direction goes unseen. In fact, every effort brings success and satisfaction proportionate to the attempt. Moreover, it is every person's duty to work towards it, since personality development is necessary for success in any field. In the writings, talks and lectures of swami Vivekananda, constructive ideas relating to personality development are profusely scattered. This article is based on the good personality that reflects. It is referenced from the book "Personality Development" by Swami Vivekananda. This book was published in 1909 by Sri Ramakrishna Ashrama Mysore in the month of December. It is said that our mind is more or less emphasized on the good and bad perceptions, but most optimistically we tip for the good perceptions. This article is mainly focused on the practical aspects of human minds and thoughts. So I am very grateful and thankful to its writer and publisher as such I could get some good notions to share the inspiring and practical way of sensitizing a man personalities to fellow friends of 21st century. Thank you once again for your cooperation to give it more emphasized and Acknowledged.

According to the Cambridge International Dictionary of English, Your Personality is the type of person you are, which is shown by the way you behave, feel and think. Personality, according to the Longman Dictionary of Contemporary English, is the whole nature or characters of a person. How a person behaves feels and thinks; how he conducts himself in a given set of circumstances is largely determined by the state

of his mind. Mere external appearance or a person's speech or mannerisms are only fringes of one's personality. They do not reflect the real personality. Personality development in the real sense refers to deeper levels of a person. So a study of our personality should start from a clear grasp of the nature of our mind, and how it functions.

The science of Yoga claims that it has discovered the Laws which develop this personality and by proper attention to those laws and methods, each one can grow and strengthen his personality. This is one of the great practical things, and this is the secret of all form of educations. This has a universal application; in the life of a householder, the life of poor, the rich, the man of business, and the spiritual man, in every one's life, it is a great thing that strengthening the personality of every one's life. There are laws, very fine, which are behind the physical laws, as we know of now. That is to say, there are no such realities as a physical world, a mental world, and a spiritual world. Whatever is, it is one. Let us say, it is a sort of tapering existence; the thickest part is here, it tapers and becomes finer and finer. The finest is what we call spirit; the grossest, the body and just as it is here in microcosm. The universe of ours is exactly like that; it is the gross external thickness, and it tapers into something finer and finer until it becomes God.

We also know that the greatest power is lodged in the fine, not in the course. As for example we see a man takes up a huge weight, we see his muscles swell and all over his body we see sign of exertion and we think the muscles are powerful things, but it is the thin thread like things, the nerves, which bring power to the muscles; the moment one of these is cut off from reaching the muscles, they are not able to work at all. These tiny nerves bring the power from something still finer, and that again in it's

Contd.....

turn brings it from something finer still-thought, and so on. So, it is the fine, the seat of power. Of course, we can see the movements in the gross; but when fine movements take place, we cannot see them. When a gross thing moves, we can catch it and thus we naturally identify movement with things which are gross, but all the powers are really in the fine. We do not see any movement in the perhaps, because the movement is so intense that we cannot perceive it, but if by any science, any investigation, we are helped to hold of these finer forces which are the cause of the expression, the expression itself will be under controlled.

One more example, if there is a little bubbles coming out from the bottom of a lake; we do not see it coming all the time, we see it only when it bursts on the surface; so, we can perceive thoughts only after they develop a great deal, or after they become actions. We

constantly complain that we have no control over our actions, over our thoughts. But how can we have it? If we can get control over the fine movements, if we can get hold of thought at the root, before it has become thought, before it has become action, then it would be possible for us to control the whole. Now, if there is a method by which we can analyze, investigate, understand and finally grapple with those finer powers, the finer causes, then alone is it possible to have control over ourselves and the man who has control over his own mind assuredly will have control over every other mind. That is why purity and morality has been always the object of religion; a pure, a moral man has control of him and all minds are the same, different parts of one mind. Now, a good deal of our physical evil we can get rid of, if we have control over fine parts; a good many worries we can throw off, if we have control over the fine movements; a good many failures can be averted, if we have control over these fine powers. This is exactly what we call **Law's of personality Development.**

वन स्मृति : जीवन ज्योति

- वन मे ही जीवन;
वन से ही जीवन ॥
- ऐक का अंश, अनेक का वंश;
वृक्ष का वंश, विश्व का वंश ॥
- ऐक का अंत, अनेक का अंत;
वृक्ष का अंत, विश्व का अंत ॥
- जो बोयेगा वो बचेगा;
जो काटेगा वो कटेगा ॥
- वन बिन जीवन नही;
जीवन बिन वन नही ॥
- झाड से जगदीश;
पेड से परमेश्वर ॥

Shivraj Amabadan Gadhavi
RFO Trainee, 2016-17 Batch

"He who knows one lump of clay has known all the clay in the universe. He who knows the secret of every mind and has power over every mind"

-Swami Vivekananda



KNOWLEDGE IN YOUR POCKET

Mr. Dhaval Patel
RFO Trainee, 2016-17 Batch

Indians have become the top android app users in the world. More than 220 million Smartphone users in India. Mobile Applications frequently serve to provide users with similar services to those accessed on PCs. In this Article all application are top rated, user friendly and also useful for department persons as well as general public.

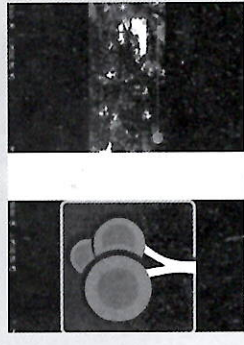
Application about Plants of India:

Trees - A Field Guide to Common Trees of Urban India
Product of Ladybird Environmental Consulting

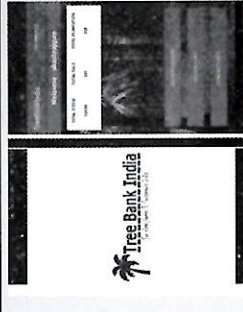
Promote nature study widely across the Indian Cities. It covers 50 common tree species.



Tree Watch - Facilitate easy identification of some of the common tree in India.
Product of Earthwatch Institute India
Promote the understanding and action necessary for a sustainable environment.

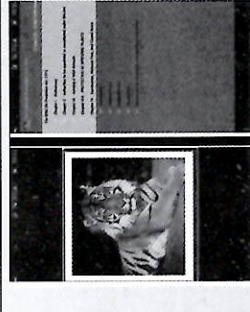


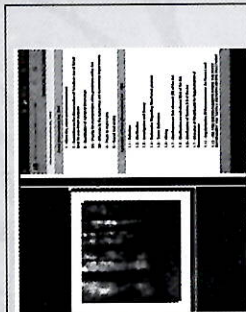
Tree Bank India - For clean Green & Prosperous India
Product of Siddhant Farms.
Secure availability of plants in large quantity and to promote the small farmers to grow tree plant nurseries and other farm based product.



Application for Forest Low:

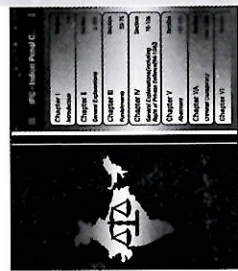
India - The Wildlife Protection Act, 1972
Product of Rachit Technology.
It's covered all The Wildlife Protection Act, 1972 Chapter & Section wise and user friendly.





The Forest Conservation Act, 1980

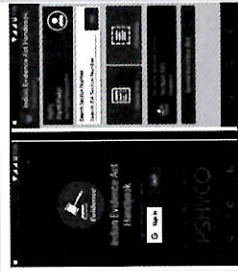
Product of Rachit Technology.
View data section wise and Chapter wise
View Favorites sections & add notes to each section



IPC – Indian Penal Code
Product of OK Pvt. Ltd.
Indian Penal Code is main criminal code of India. It's covered all Chapter and Section of IPC.



CrPC – Code of Criminal Procedures
Product of SimplySocial
Friendly design with excellent user experience. With daily notifications, judgments and news.

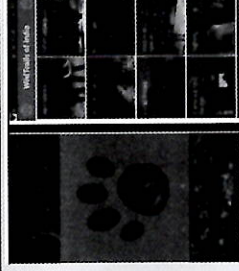


Indian Evidence Act Handbook
Product of Pshyco Technology
Features: App is a handbook for the Indian Evidence Act Law. Section by Chapters, Search Section, Recent last Viewed Section & Share details of a Section etc.

Application about Wildlife with different uses:



Wildlife Sanctuaries of India
Product of The Nature Web.
This application covered 442 wildlife sanctuaries of India with details. Among these, 41 Tiger Reserve, Bird sanctuaries, and National Park.



Wild Trails of India – Wildlife app.
Product of Wildtrails Technologies.
This application gives details about the Sanctuaries, Safari Details, Wildlife Sightings, Stay, Local guides and Tour operators.



Encyclopedia Animals : Mammals
Product of afufstudio.
This application is perfect way of dinging our all about the exciting world of animals.
Packed with fascinating information on interesting activates and brilliant pictures, also useful for creating awareness about mammals.

Reference: Android Play store

Eat Right for Your Type

Jonathan Lalchhanmawia
RFO Trainee, 2016-17 Batch

We all know the importance of blood. Since the days of our forefathers, countries bore people to close blood relatives. How babies are made and its miracle of birth, deadly diseases, and different causes of death were believed to be related to blood. We, Christians believe that it was the blood of Jesus Christ that saved us and the centre of our beliefs today. And we, Mizos, as a nation, give importance to blood relatives, it would seem, even more so than other nations do. Since blood has this much importance in our lives, studies are on going to understand more about blood. Whatever disease we may contract, the treatment always demand a blood test.

Those before us have discovered the different blood groups and if we stick to a blood group related diet, it is believed to strengthen our lives and maintain proper health and ideal weight. And in the opposite case, it may lead to different diseases. Here are the different kinds of blood groups with their related foods and non-related food items.

Blood Group "O":
This is the first existing blood group where humans right from the beginning their dependence was on the meat of animals. Their body type supports heavy exercising, respond well to meat proteins but not to saturated fats and milk

Essential and Non-essential foods-
Essential foods includes all kinds of meat other pork and meat of goose is to the body, fish, butter, soya milk/cheese, linseed oil, olive oil, pumpkin seeds, walnuts, Rice, Oatmeal, lentils, broccoli, onion, garlic, chilli, plum, corny powder, soda water, ginger.

They should avoid pork, milk and milk products, eggs, ice-cream, cottonseed, oil, groundnut oil, safflower oil, cashew nut, peanuts, cowpea, products from wheat, cornflakes, cabbage, cauliflower, mushroom, potato, corn, avocado, orange, banana,

watermelon, musk melon, coconut, tea, coffee.
Blood Group "A"-

Blood group A appears after group O where humans started agriculture and farming practices. Vegetables is best suited to the body and among the meat only fish is thought to be suited to the body. Instead of processed food they required more to take organic and fresh vegetables. Since they are more prone to heart diseases, cancer and blood sugar, they need to take food which can protect from these diseases.
Essential and Non-essential foods-

Essential food includes fish, soyabean, cheese/milk, linseed oil, olive oil, Rice cake, soya flour bread, rice flour, oat flour, beetroot leaves, broccoli, onion, pumpkin, grapefruit, lemons, pineapple, plums, ginger, green tea, coffee, red wine.

It's best to avoid all types of meat except meat of chicken and turkey. Crab, milk, butter, cheese, cottonseed oil, groundnut oil, cashew nut and other nuts, cowpea, cabbage, mushroom, chillies, potato, tomato, banana, mango, orange, papaya, watermelon/musk melon, coconut.

Blood Group "B"
Blood group "B" appears due to the advancement of humans. People having blood group "B" are more stronger in nature and they are less prone to cancer and heart disease and also the chances of recovering from these diseases is higher but they are more prone to minor disease. If they take the right food their life expectancy is also higher. Since they got the chance to take both meat and vegetables and are referred to as "balance".

Essential and Non-essential foods-
Essential food includes rice, oatmeal, mutton, meat of lamb and rabbit, fish, milk and milk products, butter/cheese, olive oil, cowpea, beetroots, cabbage, peppers, sweet potato, yams, banana, papaya, green/herbal tea.

Non-essential foods like chicken, pork, meat of duck/goose, crab, prawns, snails, frog, ice-cream, rapeseed oil, cotton seed oil, safflower oil, cashew nuts, peanuts, sunflower/sesame seeds, cornflakes, atta, pumpkin, tomato, avocado, coconut, star fruit should be avoided.

Blood Group "AB"

The discovery of Blood group "AB" has not been more than 1000 years. Out of 100 people only 3-5 people are found to be AB blood group. The mechanism of this blood group is very complex and difficult to explain. All foods that Group A and B should avoid should also be avoided by Group AB.

Essential and Non-essential foods-

Essential food includes mutton, meat of lamb and rabbit, turkey, milk of goat, olive oil, peanuts, walnuts, chestnuts, soyabean, lentils, rice, oatmeal, beetroots, broccoli, cauliflower, mushrooms, cucumber, garlic, grape, plums, coffee, green tea.

They should avoid red meat, chicken, duck and goose meat, crab, butter, ice-cream, cottonseed oil, sunflower oil, safflower oil, sesame oil, cowpea, cornflakes, chillies, avocado, banana, guava, mango, coconut, star fruit, pickles.

We then have to know the importance of **LECTINS** and how they work. Lectin is a compound protein and is found available in all materials in nature. Its work on different blood groups is different.

- For blood group B the lectin content in the meat of chicken may be as poisonous when meets with the antigens in the cells agglutinates and forms a virus which creates problems to the nervous and immune system. When enters the blood it can create heart attack.

- For blood group A and B tomato can create stomach ulcer but for O and AB there is no effect.
- If a group O person takes meat, due to high content of acid in the stomach, it will faster the metabolic rate and converts into muscle immediately. But for a group A person, due to low acid content in the stomach it converts into fats rather than converts to muscle strength.

- Also a group A person has low ability to digest milk and milk products which cause insulin reaction and reduces the metabolism rate. They contain more saturated fats which can cause heart disease and blood sugar.

Other than this there are other essential foods which we called food supplement which includes most of the vitamins containing fruits and vegetables and other herbs. Here the effect may also vary. In group O herbal tea makes you feel relaxing where as for group A it triggers the energy but for group B there is no much effect.

It may come as a surprise that, though we are not medical experts, that we are writing about all of this, but this is purely out of a feeling of necessity for our fellowmen. All these are taken from Dr. Peter J. D'Adamo's book "Eat Right for Your Type" from a 50 year study with both his parents Dr James D'Adamo and Christiana D'Adamo. Allopathic medicine sometime can have side effects on our body. Treatment with Naturopathy, Acupuncture, Ayurvedic etc are believed to not have side effects. It is good to avoid unhealthy foods and take only what is essential to the body and taking care of our body is our duty.

Reference :- "Eat right for your type" by Dr. Peter J.D'Adamo.

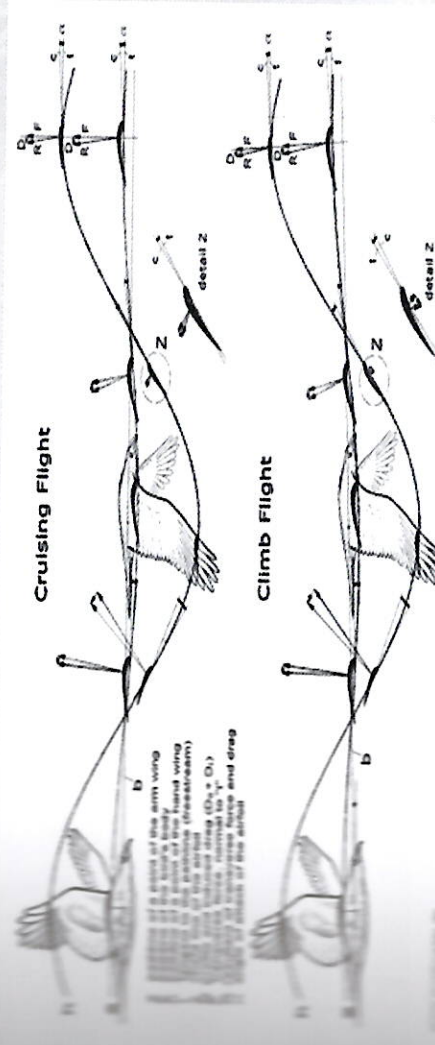
Mechanism of Flight in Birds

H. Lalremruata
RFO Trainee, 2016-17 Batch

A bird flies on the principle of **indirect movement**. It moves the air, which by its displacement moves the birds. Air displaced by the beating of wings, sets up currents that keeps the animal aloft and move forward, resulting in flight. According to **Newton's third law**, the force of reaction of air is equal and opposite to that exerted by the moving wing on the air.

The wing is not a simple airfoil plane. It functions both as an **airfoil** (lifting surface) and as a **propeller** for forward motion. It is thick in front, thin and tapering behind, and presenting in profile a concave streamlined upper and a flat or slightly concave lower surface.

As the air flows across the tilted wings, the air stream moves faster along its upper convex surface than the concave lower surface. In accordance with **Bernoulli's law**, the differential in air speed will in decrease in air pressure above the wing surface relative to the underside. The two forces thus generated, suction above and upward thrust below the wings, tend to **lift**, keeping the bird aloft and pushing forwards and upwards. The air also pushes the wing horizontally backwards and tends to **drag** or slow the bird down. Thus the force of air on the wing can be resolved into a vertical **lift component** perpendicular to the air stream, and a backward **drag component** parallel to the air



For the bird to fly, the lift force must equal or exceeds the force of gravity on the bird i.e. the weight of the bird. Various factor increases the lift force, such as increase in the surface area of the wing and in the speed of air flow across the wing. If the angle of the wing becomes too great, i.e. when the wings become tilted sharply, air swirls into the low pressure area above causing **turbulence** (increased drag). As a result lift is lost, wings stall, movement slows down and the birds' plummet towards the earth.

Some birds use deliberate stalling before a **dive**. But in **landing**, a bird must slow down without stalling to avoid crashing. This is achieved in many ways, by reducing turbulence. In eagle, vulture, etc when slowing down to perch, the primary feathers are widely spread, thus causing gap or **slots** between the leading edge of these feathers. These slots perform the function of **Venturi tubes** causing **Bernoulli Effect**. Air rushes through them with greater velocity causing more lift at the slower landing speed. The vane of some primaries may be reduced or emarginated to increase the lift of the slots.

Another method of producing a slot with venturi effect is by raising the Bastard wing or **alula** which is a separate tuft of feathers on the pollex. Some birds obtain additional lift on landing by curving out and bending down their tail feathers. The tail thus works both as a brake and a high-lift, low speed airfoil.

Illustration: VENTURI TUBES by R.L. Kotpal

Keeda Jadi - A Boon from Himalayan Region

Svapnil K. Patel
RFO Trainee, 2016-17 Batch

Himalaya is the place of medical plants which cannot be found anywhere else. Their rarity and remarkable healing power makes them expensive in the global market. One such rich biological resource is Keeda Jadi. It can cure a variety of ailments from such as fatigue and cancer and to cure impotency. It is also known as Caterpillar fungus (English) and Yartsa Gungu (Tibetan). In the global market, Keeda Jadi worth Rs 18 lakh per kilogram but due to unnatural practices those being used to produce Keeda Jadi are affecting the Himalayan region and considering this fact trading of Keeda Jadi is declared illegal in India. If this is so much costly then obviously it must have some thing special and the first question arise about it is "what is Keeda Jadi?"



Photo:-*Cordyceps sinensis*; Grabed at Indian Council of Forestry research and Education (ICFRE), Museum-Dehradun.

Keeda Jadi (*Cordyceps sinensis*) is basically a caterpillar infected and killed by a fungus and later on mummified by litter of trees mixed with the organic matter. The caterpillars reside underground in alpine grass for about 5 years before pupating and attacked by the fungus.

Columnar mushroom (5-15 cm) like shapes grows out of the forehead of the buried dead caterpillar. *Cordyceps sinensis* parasitizes the moths of the Thitarodes genus in the Ghost Moth family, Hepialidae; specifically species from the Tibetan Plateau, and the Himalayas.

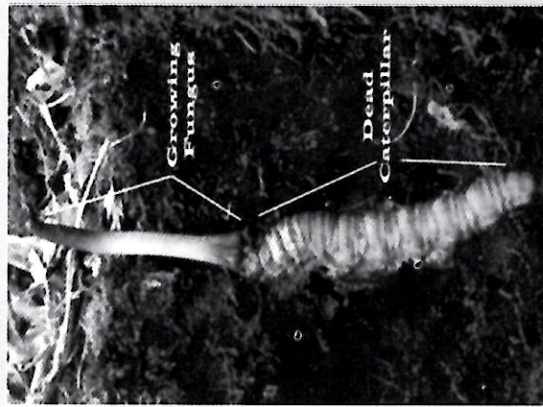


Photo:-*Cordyceps sinensis*
Photo source:- Superfoodify.com/cordyceps-sinensis

Scientific classification

Kingdom:-Fungi
Division:-Ascomycota
Class:-Sordariomycetes
Order:-Hypocreales
Family:-Ophiocordycipitaceae
Genus:-*Cordyceps*
Species:-*C. sinensis*

Binomial name:-*Cordyceps sinensis*(Berk.)

Cordyceps sinensis has been used for at least 1000 years for its reputed abilities to treat many diseases related to lungs, kidney, and erectile dysfunction. *Cordyceps* species, especially *C. sinensis* is extraordinary nutritional supplement and medicinal mushroom and an important source of material in Traditional Chinese Medicine. One of the achievement of modern research is the discovery of new antibiotics in this medicinal mushroom. One of these, cordycepin is very effective against various types of bacteria that have showed resistance to other more common antibiotics. *Cordyceps* controls low blood pressure and strengthens the heart beat and use in the treatment of kidney, immune disorder, chronic obstructive pulmonary diseases and asthma. It is used in treatment for impotence, as an aphrodisiac in both men and women. Some additional health benefits of *Cordyceps* are enhancement of physical stamina, recovery from stroke and chronic heart disease, Maintains liver function, Maintains kidney function, antioxidant properties etc.

It also has beta-glucans and polysaccharides in large quantities. Presence of CPS-2, a water soluble polysaccharide, is reported to relieve renal failure caused by fulgerizing kidney altering blood urea and serum creatinine in studies published in July issue of Fitoterpia 2010.

In a research report published in a 1998 issue of The Journal of Alternative and Complementary Medicine, a significant improvement in majority of patients suffering from various respiratory diseases (chronic bronchitis, bronchial asthma, or cor pulmonale) was reported after use of a *Cordyceps Sinensis* supplement for 2-12 weeks. Since drugs with aphrodisiacal properties are relatively expensive, international traders purchase medicinal mushroom or keeda jadi at a premium price from local markets. One kilogram (3000 pieces) of mummified caterpillar is usually sold approximately 0.2 million rupees and fetches \$10,000 - 15000/kg in

international market. For the high medicinal value and trade restrictions, international traders buy it illegally at high prices from villagers in hilly regions of India, Nepal and Bhutan. Their high value also leads to the conflict among villages and illegal traders as in India it is not legalized. This rare fungus is only found when summer sets in and snow (glacier) melts at higher altitudes of Kumaon region and exposes mummified caterpillars. People have started using uneven means to collect Keeda Jadi. Sometimes, forests are put on fire to melt the snow. Such unnatural practices are causing damage to the environment and precious species also. In such scenario, government should interfere and take actions to preserve nature, and rights of locals at the same time. The government should take necessary steps to preserve these endangered caterpillar fungi as well as surrounding forests.

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3. Bhandari A. K., Negi J. S., Bisht V. K., Singh N & Sundriyal R. C., *Cordyceps sinensis*: fungus inhabiting the Himalayas and a source of income, *Curr Sci* 103(8) (2012) 876.

All about Snake-Bites

Snake bite is a major environmental and occupational hazard in rural India. India has one of the highest rates of death from snake bite in the world. WHO has estimated the highest number of snake bite (83,000) and deaths (11,000) per annum in India. For snake bite no reliable national data available. 80% of snake bite victims in most of the developing countries seek traditional remedies before visiting a health care facility. This has resulted in high mortality. In India, High occurrence of snake bite is reported in the states of Uttar Pradesh, Andhra Pradesh, Tamil Nadu, Kerala, and Maharashtra. Incidences of snake bite are twice in male than female. Majority of the bites are on the lower extremities. 50% of bites by venomous snakes are dry bites that result in negligible envenomation.

Worldwide, only about 15% of the more than 3000 species of snakes are considered dangerous to humans. There are around 216 species of snakes in India, out of which 52 are recognized as poisonous.

How to identify Venomous Snakes?

Some harmless snakes have evolved to look almost identical to venomous ones. Some of the most notorious venomous snakes can be recognized by their size, shape, color, pattern of markings, their behavior and the sound they make when they feel threatened.

Out of all the snakes found in India. Following four snakes are responsible for majority of the venomous snake bite. Traditionally they are known as Big four.

Common Name	Krait
Scientific Name	<i>Bungaruscaeruleus</i>
Length	3 – 4 feet
General Description	Shiny Black Body with milky white band (paired /unpaired)
Sound	Generally don't produce any kind of sound, known as Silent Killer
Identification Key	Shiny Body & Alternate Bands
Venom	Neurotoxic
Common Name	Cobra
Scientific Name	<i>Najanaaja</i>
Length	4.5 to 5.5 feet
General Description	Smooth scaled snake, with black eye and wide neck & head. Black dark brown to creamy white body color.
Sound	Shhh.... Like sound in breathing pattern (increasing and decreasing pattern.)
Identification Key	they rear up, spread a hood, hiss and make repeated strikes towards the aggressor. Hood have s pectacled or "O" shaped or sometime no design.
Venom	Neurotoxic

Common Name	Russell's viper
Scientific Name	<i>DaboiaRusselii</i>
Length	3.5 – 4.5 feet
General Description	Triangular head, Robust & Stout body
Sound	Produces Blowing hiss sound; similar like pressure cooker whistle.
Identification Key	Chain link like design on body
Venom	From head to tail Hemotoxic

Common Name	Saw-scaled viper
Scientific Name	<i>Echiscarinatus</i>
Length	1.5 – 2 feet
General Description	Dry looking body, covered with rough scales, Body color from dark brown-grey-brick red to reddish brown
Sound	Produces the grating rasp like sound similar sound like when we move saw on wood.
Identification Key	Aero plane shape design on head
Venom	Hemotoxic

How snake bite can be avoided?

Snakes may enter the house in search of food or to find a hiding place for a while. Do not keep livestock, especially chickens, in the house, as snakes may come to hunt them. Store food in rat-proof containers. Regularly check houses for snakes and, if possible, avoid those types of house construction that will provide snakes with hiding places (e.g. thatched rooves with open eaves, mud and straw walls with large cracks and cavities and large unsealed spaces beneath floorboards). If possible, try to avoid sleeping on the ground. If you have to sleep on the ground, use an insecticide-impregnated mosquito net that is well tucked in under the mattress or sleeping mat. This will protect against mosquitoes and other biting insects, centipedes, scorpions and snakes.

Try not to provide hiding places for snakes. Clear termite mounds, heaps of rubbish, building materials etc. from near the house. Do not have tree branches touching the house. Keep grass short or clear the ground around your house and clear low bushes in the vicinity so that snakes cannot hide close to the house. Keep your granary away from the house, it may attract rodents that snakes will hunt. Water sources, reservoirs and ponds may also attract prey animals such as frogs and toads. Listen to wild and domestic animals, especially birds, as they warn of a snake nearby. Use a light when you walk outside the house or visit the latrine at night.

Avoid snakes as far as possible, including those displayed by snake charmers who are frequently bitten. Never handle, threaten or attack a snake and never intentionally trap or corner a snake in an enclosed space. Keep young children away from areas known to be snake-infested. In occupations that carry a risk of snake bite, such as rice farming and fish farming, employers might be held responsible for providing protective clothing (boots). One should never intentionally run over snakes on the road. The snake may not be instantly killed and may lie injured and pose a risk to others. The snake may also be injured and trapped

under the vehicle, from where it will crawl out once the vehicle has stopped or has been parked in the house compound or garage.

Know your local snakes, know the sort of places where they like to live and hide, know at what times of year, at what times of day/night or in what kinds of weather they are most likely to be active.

If after taking all the cares in case, snakes succeeded to kiss you or anyone near around you, in that case, try to observe following things.

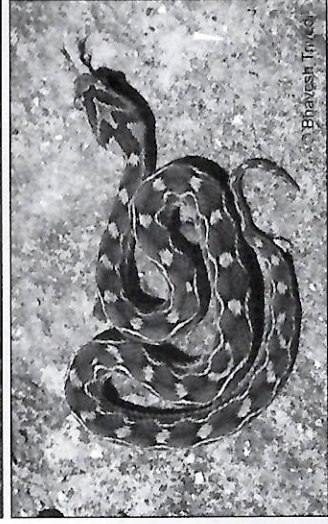
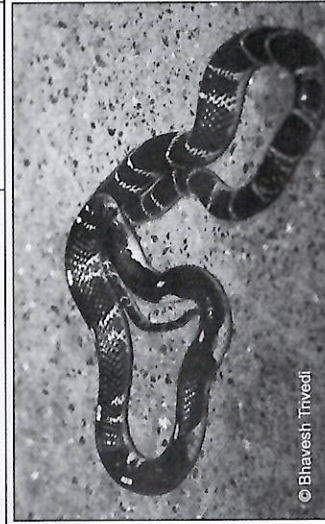
Early symptoms and signs in casevenomous snake-bite.

Following the immediate pain of mechanical penetration of the skin by the snake's fangs, there may be increasing local pain (burning, bursting, throbbing) at the site of the bite

- Local swelling that gradually extends proximally up the bitten limb
- Tender, painful enlargement of the regional lymph nodes draining the site of the bite
- Bites by kraits, sea snakes and Philippine cobras may be virtually painless and may cause negligible local swelling.
- Symptoms and signs vary according to the species of snake responsible for the bite and the amount of venom injected

Clinical symptoms and sign in various venomous snake-bite.

Feature	Cobra	Krait	Russell's Viper	Saw-scaled Viper
Local pain/tissue damage	Yes	No	Yes	Yes
Ptosis, neurological sign	Yes	Yes	No	No
Hemostatic abnormality	No	May Occur	Yes	Yes
Renal complication	No	No	Yes	No
Response to neostigmine	Yes	May Occur	No	No
Response to ASV	Yes	Yes	Yes	Yes



Causes of Pseudo Symptoms and signs:

Causes of Pseudo symptoms and signs may appear in following situations.

- Some people who are bitten by snakes or suspect or imagine that they have been bitten, may develop quite striking symptoms and signs, even when no venom has been injected. This results from an understandable fear of the consequences of a real venomous bite.
- Anxious people may overbreathe so that they develop pins and needles of the extremities, stiffness of their hands and feet and dizziness.
- Others may develop vasovagal shock after the bite or suspected bite - faintness and collapse with profound slowing of the heart.
- Others may become highly agitated and irrational and may develop a wide range of misleading symptoms.
- Another source of symptoms and signs not caused by snake venom is first aid and traditional treatments.
- Constricting bands or tourniquets may cause pain, swelling and congestion.
- Topical herbal remedies may cause vomiting.
- Instillation of irritant plant juices into the eyes may cause conjunctivitis.
- Excessive insufflations of oils into the respiratory tract may lead to aspiration pneumonia, bronchospasm, ruptured ear drums and pneumothorax.
- Injections, cauterization, immersion in scalding liquid and heating over a fire can result in devastating injuries.

First Aid Treatment

- Do not allow victim to walk even for a short distance; just carry him/her in any form, especially when bite is at leg. As any movement or muscular contraction increases absorption of venom into the bloodstream and lymphatics.
- Use of Tourniquet, Electrotherapy, Cutting, Pressure immobilization, Nitric oxide donor (Nitrogessic ointment/ Nitrate Spray) should be avoided.
- Restrain the patient. 70% of all snakebites are from nonvenomous species. Only 50% of bites by venomous species actually envenomate the patient.
- Immobilize the victim in the same way as in case of fractured limb. Use bandages or cloth to hold the joints, not to block the blood supply or apply pressure. Do not apply any compression in the form of tight ligatures, they don't work and can be dangerous!
- Get to Hospital Immediately. Traditional remedies have NO PROVEN benefit in treating snakebite.
- Tell the Doctor of any systemic symptoms that manifest on the way of hospital and provide the best possible information to the Doctor.
- Traditional Methods to Be Discarded.

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Mr. Likha Obi
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The State bird of Arunachal Pradesh is Great hornbill (*Buceros bicornis*). Habit and habitat of Great hornbill generally found in the canopy of the rainforest and wet, tall, evergreen forests. They can find shelter in the holes of the trees, and may cover large areas of the forest in a single day in search of food.

Common Name – Great hornbill

Local Name – Banrao

Zoological Name – *Buceros bicornis*

Kingdom – Animalia

Phylum – Chordata

Class – Aves

Order – Bucerotiformes

Family – Bucerotidae

Subfamily – Bucerotinae

Genus – *Buceros*



DISTINCTIVE IDENTIFICATION

Great hornbill has been classified as Near Threatened by the IUCN. Size between 90cm to 130cm the weight of adult is between 2.5 kg. To 4.0 kg., and have a wingspan of 145 cm. to 170 cm. They have long, heavy bills with a light, hollow casqued reaching up to 8 inches on the upper mandible. Upper-wings are black with white coverts forming a conspicuous wing-bar. The flight feathers are broadly tipped white and the under-wings are black and white with black coverts, and black flight feathers with white bases and tips. Male has black and white plumage with some white parts washed yellow. This is due to the oily exudation produced by the uropygial gland when the bird is preening. It rubs its head against the gland situated at the upper base of the tail, and transfers this oil to its plumage. The male spreads the preen gland secretion, which is yellow, onto the primary feathers and bill to give them the bright yellow color.

Male has a huge yellow and black U-shaped casqued on the upper base of the bill and the fore crown, double-pointed at front and bordered with black. The long, down-curved bill has yellowish upper mandible with reddish tip, and paler lower mandible, rather whitish at base with yellow tip. Both mandibles are serrate. They have white lower belly, upper and under-tail-coverts and tail.

The neck is creamy-white to buff-yellow. Females are smaller than males and have bluish-white instead of white eyes with red eye-ring, becoming brighter during the breeding season, although the orbital skin is pinkish. Great hornbills are sexually dimorphic with the female having a pearly white iris and pink to bright red bare circum-orbital skin. The male has a deep red iris with the skin surrounding the eye being black.

*There is no Wi-fi in the forest,
but I promise you will find
a better connection*

Upper wings are black with white coverts forming a conspicuous wing-bar. The flight feathers are broadly tipped white and the under-wings are black and white with black coverts, and black flight feathers with white bases and tips. They are usually seen in small groups or in pairs. Male has black and white plumage with some white parts washed yellow. This is due to the oily exudation produced by the uropygial gland when the bird is preening. It rubs its head against the gland. Nesting and breeding season occurs between January and April. The mating process of the Great Hornbills begins with males clashing and butting casqued in mid-air in order to "win" a mate. When male is ready to lay eggs, she will climb into an empty tree hole.

Distribution: The Great Hornbill range in South and Southeast Asia. In South Asia they are found in a few forest areas in the Western Ghats and in the forests along the Himalayas. They are also residents in Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, and Vietnam. They occur up to 2000 meters in the Himalayas, and usually from lowlands to 1500 meters of elevation. Great hornbills are usually seen in small groups or in pairs, usually in larger groups.

Nesting and breeding season occurs between January and April. They prefer mature forest and with trees that extend beyond the height of the canopy, for nesting. During the breeding season Great hornbills become very vocal. Female hornbill builds a nest in the hollow of a large tree using the opening with a plaster made up mainly of feces. Female remains imprisoned there, and it is on the male to bring her food, until the chicks are half developed. During this period the male undergoes a complete moult. The mating process of the Great Hornbills sometimes begins with the male clashing and butting casqued in mid-air in order to "win" a mate. When the female is ready to lay eggs, she will climb into an empty tree hole. Eggs 1 or 2, incubated by female for 35 to 40 days. The female emerges before the young fledge. The young birds seal the entrance again and stay with both parents. They fledge between 70 and 100 days. The average lifespan of Great Hornbill is between 30 to 40 years.

The flight is noisy, producing a loud, scraping noise both in flapping and gliding. The flight is stiff flaps followed by glides with the fingers splayed and up curled. They sometimes fly at height over forests. Wing beats are heavy and the sound produced by birds in flight can be heard from a distance. This sound has been likened to the puffing of a steam locomotive starting up. Usually, they feed on fruits, but they also feed on small mammals, birds, small reptiles, and insects. They produce loud, nasal, honking call "tok", repeated at regular intervals while the bird stretches its neck vertically up with the bill pointed upwards. They give deep, hoarse grunts, barks and roars.

Conservation Status Schedule – I according to wildlife (Protection) act, 1972 and classified as Threatened (NT) by the IUCN.

The Wings of Nature (The amazing bird's diversity in Gujarat)

Rohit M. Chaudhari
RFO Trainee, 2016-17 Batch

Keywords: Birds spp., wetlands, avifauna, WLS & NPs

The attractive mosaic of landscapes comprising rolling hills, flatlands, forests, grasslands, deserts, wetlands, share lands, agriculture areas etc. coupled with the cultural traditions of local people has imparted avian diversity to Gujarat. The state has 498 species of birds against the total of 1238 species in the country the maximum bird species found in saurashtra region.

Out of 26 WLS & NP, 7 sanctuaries (28%) viz. Nalsarovar, khijadiya, thol, kachchh desert porbandar, gaga sanctuary & kachchh Bustard mainly pertain to avifauna. Out of these, 6 sanctuaries are exclusively dedicated to birds & 7th one the kachchh desert sanctuary has the famous flamingo city as its main attraction. Besides, 6 other sanctuaries viz. Gir WLS, Gir NP, Marine WLS, marine NP, hingolgadh WLS & shoolpaneshwar WLS have considerable avifauna. In fact, it was remarked by Dr. Salim Ali, the great ornithologist that had Gir NP & sanctuary not been lion protected areas, they would have been known as great bird sanctuaries of Gujarat. Thus, out of 26%, 13 % have avifauna as their main or even core form of biodiversity.



lesser florican

Wetlands	India	Gujarat
Inland wetlands	35,589 sq.km	2,092 sq.km
Coastal wetlands	40,230 sq.km	25,083 sq.km
Total	75,819 sq.km	27,175 sq.km

Gujarat has a total of 831 wetlands of which 438 are coastal & 393 are inland. The coastal & inland wetlands cover 92.3% & 7.7% of the total wetland areas respectively.

Nalsaravar which is a fresh water wetland is the largest bird sanctuary in the state having about 226 spp. of birds of which 150 are waterfowls. Apart from providing food & habitat to a variety of resident birds, the array of wetlands in the state provides intermittent habitats for the migratory birds in transition. The wetlands are the most crucial components of the international flyway of migratory birds. The important bird's spp. In Gujarat are Great Indian bustard, houbara bustard, lesser florican, and four spp. Of harriers, lesser flamingo, sarus crane, common crane, pelicans, six spp. Of storks, four spp. Of bulbul etc. in fact the state has second largest population of sarus cranes in the country. As per the 2004 census co-ordinated by GEER Foundation, the population of sarus cranes in Gujarat is found to be growing at the total count of 1657.

The flamingo city in kachchh is the breeding ground for the lesser flamingoes that visit the area in millions for breeding. In fact, significant population of lesser flamingoes are seen in the state throughout the year.

The great Indian bustard found in the kachchh great Indian bustard sanctuary add to the diversity & magnificence of the total avifauna of the state making the skies colorful with the wings of nature.

'Tigers are Our Brothers': Understanding Human-Nature Relations in the Mishmi Hills, Northeast India

Ramwada Bagang
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Human nature relations are diverse, multifaceted and often contradictory, especially the relationships with animals. Mishmi people living on the Indo-India border claim tigers to be their brothers and take credit for tiger protection as they observe taboos against hunting tigers. Drawing on this notion of relatedness with tigers, local residents of the Dibang Valley question the governments' recent plans to declare the Dibang Wildlife Sanctuary into a tiger Tiger Reserve and its scientific surveys of tiger and habitat mapping.

Keywords: Tigers, Mishmi, Hunting.

The Mishmi are one of 26 indigenous groups inhabiting Arunachal Pradesh. Three clans of Mishmi reside on the Indian side of the international border and one on the Chinese side.

Angache, a 45-year-old Mishmi man was very vocal about the forest government's role in Dibang Valley. His question was straight:

Why a tiger reserve here? We don't hunt tigers, they are our brothers! Tigers and humans were born to the same mother. We kill tigers only as a last option, when they become a human threat or when they are killed in traps accidentally. We are protecting them anyway.

Anyone visiting the Mishmi hills and interested in wildlife and conservation cannot fail to encounter the mythological story of Mishmi and tigers as brothers. Such narratives of tigers as siblings are popular in other parts of Arunachal Pradesh. According to the Mishmi mythology, Mishmi and tigers were born to the same mother and were siblings (tiger, the elder brother and human, the younger brother). The younger brother hunted a deer and left the deer

with the elder brother to collect firewood. On his return, he was terrified to see his brother eating the meat raw. He told his mother, 'my younger brother is a tiger. If he can eat raw meat, then one day he will eat me too'. The mother came up with a plan: she would hold a competition between the two brothers. The one who crossed the river and was first to reach the bank would kill the other. The tiger decided to swim across the river, whereas the Mishmi took the bridge. The tiger was the first to reach the bank, but as the tiger emerged from the water, the mother threw an antnest on his body to prevent him from winning. The tiger dived back into the water and scratched his body against a rock. The Mishmi, meanwhile, reached and climbed up the bank and shot the tiger with an arrow. Thus, the tiger died and its body floated in the river and was swept away to a faraway place. Several years later, a bird saw the bones of the tiger scattered on the riverside. The bones were white and shone bright in the sunlight. Thinking these were eggs, the bird sat upon them. From these bones came the tiger, and from the smaller bones came the leopard, the leopard cat, the clouded leopard and the civet cat. This is a story of a tiger being born again. This story is also why the Mishmi refrain from killing tigers. For the Mishmi, the tiger (*Amra*) is their elder brother (*Apiya*). It is the most revered and feared animal, and killing tigers is prohibited. In fact, it is viewed as 'homicide'.

In addition to Tigers, Hoolock gibbons (*Hyllobates hoolock*, *Ameyon* in the local language) are also considered sacred among the Mishmi. Like tigers, gibbons also enjoy the status of religious protection. Due to a sibling

relationship with them, the Mishmi are careful not to harm these animals in any way. While killing animals like tigers and gibbons are conceived as equivalent to homicide

There is a sense of moral responsibility attached to hunted animals, and taboos (*aangi*) observed during hunting and trapping makes hunting (*aambe*) a serious activity. Before setting out to hunt a ritual (*aambo*) is carried out either by an *igu* or by the hunter himself to ask for safety and success in hunting. Hunters follow a 'moral code' of conduct during hunting trips. For instance, getting angry, abusing or cursing someone, making jokes, ridiculing someone, swearing is strictly avoided. There are unique code words which are only used during hunting, especially in the high mountains. For example, *Aala* (musk deer) will be called *Tambe aaroku-*

chi, which means meat of the high mountains. These code names for animals also indicate the kind of habitat and forest types the animals are found which reflects hunter's knowledge of the landscape.

Conclusion :

In this paper, I have outlined some critical threads of how the Mishmis of Arunachal Pradesh relate to tigers, how their relation with animals ranges from protecting some animals (for example, tigers and hoolock gibbon) utilising animals for meat (takin, serow, barking deer), trading animal parts (pods of musk deer and gall bladders of bears), and if required killing carnivores that attack their cattle (wild dogs, tigers) or animals that raid their crops (bears, ungulates, wild pigs).

Van Smruti

Oh, Mother Earth
Your Hills, Snow-clad Mountains,
Forests,
In All Shapes and Formations
Bring happiness to us.
I bow to you with all my might,
I shall save your cultivable,
Fertile and nourishing soils black & red
Which are Strong and
Resistant,
And Protected by our Ancestors,
From getting weak by
Destruction and Degradation.

-Atharva Veda, Kand-12, Sukht-1, Mantra-11.

Shivraj Amabadan Gadhavi
RFO Trainee, 2016-17 Batch

- Manage through Message; Protect through Passage.
- 1st Conserve then Consume.
- Serve Green & Deserve Green
- Save Green & Behave Green.
- Follow the Forest for All the Rest.
- Tree & Free; Pain & Paid.
- Conservation through Compassion.
- Forester as a Facilitator, Manager as a Messenger.
- 1st Preserve then Deserve.







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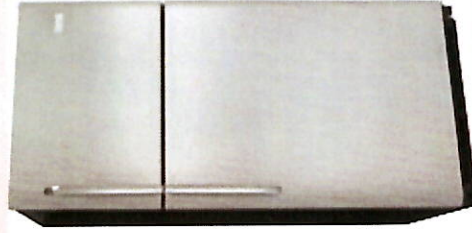
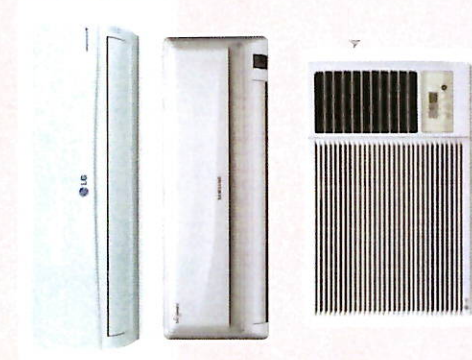


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