

ARANYAM



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

Annual Magazine, 2015
XIX Issue

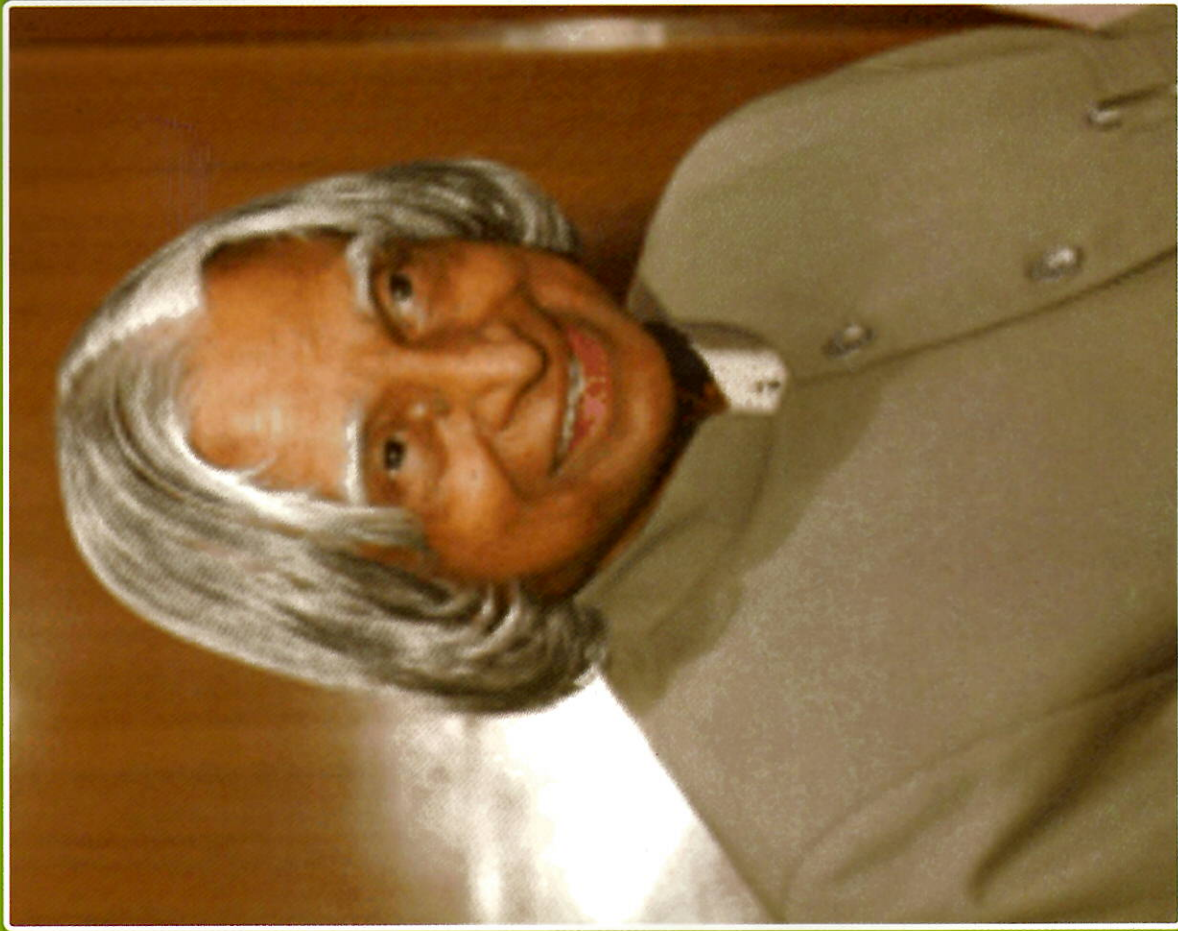


FOREST RANGE OFFICER TRAINEES 2014-15 BATCH

FIRST ROW (L TO R) : ANIKET MOTE, SHRI. AJAY RAJAK (PT & GAMES INSTRUCTOR), SHRI. N. LUKHAM IFS (PRINCIPAL), SHRI. M.P. SINGH IFS (DFE), SHRI. C. A. RAHMAN IFS (LECTURER), RUTURAJ BARTAKKE
SECOND ROW (L TO R) : RUPESH PATIL, PRAVIN DAMALE, SHIVAJI KOLHE, JAI PRAKASH MISHRA, PAPPU SINGH WASKEL, ROHINI GADEKAR, PEZANEINUO CHIELIE, MONAL KATORE, LORENCE SANGTHUM, KALPANA CHINCHKHEDE, TRUPTI THAKUR, AHMED QURESHI, JAGDISH PARHAD, GANESH GURAV, ABHIJIT DESHMUKH
THIRD ROW (L TO R) : VIJAY PATIL, DHIRAJ SINGH PARDESHI, RAGHUBANSH KUMAR SINGH, PRAMOD THOMBAL, PRAASHANT JADHAV, MAHESH MASAL, SANJEEV RANJAN, ANSOTHUNG LOTHA, AMOL KENDRE, RAMKISHAN KADAM, MD RAHEMAN SHEKH.

In the memory of

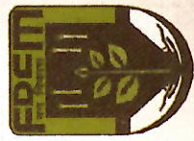
Late Dr. APJ Abdul Kalam Sir



Late Dr. A.P. J. Abdul Kalam



Shri A. K. Nigam IFS
Principal Chief Conservator of Forests
& Managing Director



GOVERNMENT OF MAHARASHTRA

Office of the

Forest Development

Corporation Of Maharashtra Limited.

12, Rawel Plaza, Kadbi Chowk,

Kamptee Road, Nagpur - 440 014

Web site : www.fdc.m.nic.in

MESSAGE

I am glad to hear that Central Academy for State Forest Service, Burnihat, Assam is bringing out the Magazine 'ARANYAM' on the passing out ceremony of Range Forest Officer Trainee's batch 2014-15. The Magazine is an expression of creative genius of the trainees and it tells about experiences and knowledge that they have gathered during their training period. When they look back and go through the Magazine, this also acts as the reminder of earlier days. I appreciate their endeavour.

Forest Management is regularly undergoing various changes and the new officers entering the field of forestry have to face variety of challenges from various stakeholders. I am sure that the Academy is making them physically fit, mentally alert and technically competent to deal with the situation.

On behalf of the Forest Development Corporation of Maharashtra Limited, I, take this opportunity to convey the Range Forest Officer Trainee's of Central Academy for State Forest Service, Burnihat our hearty best wishes for their career & life.

Dated : 31st March, 2015
Place : Nagpur (M.S.)

A handwritten signature in black ink, appearing to be 'A. K. Nigam'.

A. K. Nigam



राष्ट्रीय ग्रामीण विकास एवं पंचायती राज संस्थान
उत्तर पूर्वी क्षेत्रीय केन्द्र
(ग्रामीण विकास मंत्रालय, भारत सरकार)
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Principal Chief Conservator of Forests
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MESSAGE

I am extremely happy to learn that Central Academy for State Forest Service, Burnihat, Assam is bringing out Magazine "ARANYAM" Vol. XIX 2015. Major concern of present and future generation of Forester are Livelihood and Climate Change which needs to be taken care of by involving all stake holders.

The above objectives i.e., Climate Change and livelihood can be achieved through sustainable management of forest. Thus, Foresters are to be moulded accordingly to meet the above need.

I am sure that the Forest Rangers being trained from Central Academy for State Forest Service are being trained accordingly so that once they come out from the institute can render their best services for taking care of the above two aspect.

I wish all the Forest Range Officer Trainees grand success in life and also take this opportunity to convey my good wishes to the Principal, Faculty and the staff of the Central Academy for State Forest Service Burnihat, Assam.


S. Talukdar



Dr. R.M. Pant
Director
Ph. 9435019953 (M)
director.nirdghy@gmail.com

Dated : 28th January, 2015

MESSAGE

It gives me immense pleasure to learn that RFO Trainees of CASFOS, Burnihat are bringing out Vol. XIX 2015 of 'ARANYAM'. I had the opportunity to glance through the Vol. XVIII of 'ARANYAM' 2015 and I found this extremely valuable, enriching and informative. A wide range of articles that were published in this volume reflect your concern for management of natural resources judiciously.

Mother Nature has bestowed us with its immense wealth which needs to be conserved for the sustenance of human existence. We at any point of time must not take nature for granted as we all know 'if we destroy nature, nature will destroy us'. Laddakh, Uttarakhand and Kashmir have witnessed nature's fury in past few years. Wanton exploitation of natural resources has already done enough damage to Mother earth. It's time now that we awake to this reality and spread a message across strongly to safeguard our environment.

Kudos to young Officer Trainees of the Academy who are not just receiving training to conserve nature under the able guidance of the faculties of CASFOS but also spreading the message of conservation of natural resources through 'ARANYAM'. I hope like earlier issues of 'ARANYAM', August 2015 issue of ARANYAM will be equally thought provoking and meaningful.

I extend my best wishes to the Principal, Faculties, staff members of CASFOS and the editorial board for this noble endeavor. I wish Range Forest Officers of 2014-15 batch who would be passing out in August 2015, a very bright and successful career.


R.M. Pant



एम०पी० सिंह, भा०व०से०

वन शिक्षा निदेशक

M.P. Singh IFS

Director Forest Education



भारत सरकार, पर्यावरण एवं वन मंत्रालय,

वन शिक्षा निदेशालय

Government of India,

Ministry of Environment & Forests,

Directorate of Forest Education

डाकघर-६ फोरैस्ट, देहरादून-248 006

P.O. New Forest, Dehradun 248 006

MESSAGE

I am glad to learn that Central Academy for State Forest Service, Burnihat is publishing XIX issue of its magazine, "ARANYAM" – 2015.

Such publications provide the best medium to the Officer Trainees as well as faculty and staff to express their views, convey message and exhibit various activities and achievements of their Institution. Forestry is science in which people learn more from experiences of others.

I am hopeful that this magazine will create an urge among officer trainees to write more on nature and forests, and also help spread the cause of forest conservation.

I congratulate the Principal, faculty members and the trainees of Central Academy for State Forest Service, Burnihat for bringing out his magazine and wish them success in their endeavour.

Dated : 7th April, 2015

Place : Dehradun


M.P. Singh

Shri N. Luikham IFS

Principal

Central Academy for State Forest Service

13th Mile, Burnihat-793101, Assam

e-mail : casfosburnihat@gmail.com



Government of India

Ministry of Environment, Forests and Climate Change

Central Academy for State Forest Service

GS Road, 13 Mile, Burnihat – 793101, Assam



From the Principal's Desk

ARANYAM is a magazine brought out with ground work being done by the senior Range Officer trainees that are passing out from the Academy and this Nineteenth issue was done by the 2014-15 batch. The Range Officer trainees of 2014-15 and 2015-16 courses have put in their thoughts reflecting their interaction with the challenges and opportunities the Academy and its environs could offer.

It's a matter of great encouragement and satisfaction to witness young officer trainees display their thoughts through Aranyam that speaks much about their knowledge, skill and attitude to work and life. Over a period of time and space the refinement process of young and energetic individuals who have undergone the rigours of tight training schedules and deadlines do somehow infuse elements of transformation bringing out beautiful thought process and actionable resolutions. It's a humble beginning but the process has been initiated which I believe will be built and improved upon.

I wish all the Officer Trainees a successful and enriching life as we join hands to serve nature, public and younger generations for generations to come.

With best wishes and compliments!



N Luikham

From Editor's Corner...

Forestry as a profession is very challenging and has very crucial importance as it has to deal with the environmental challenges such as global warming, Climate Change, world's population pressure and their demands including sustainable yield. Central Academy for State Forest Service, Burnihat is setting in the rolling motion of progress in every sphere including curriculum activities.

It is really a matter of great satisfaction that we have been able to bring into focus the XIXth issue of 'ARANYAM' the annual magazine of Central Academy for State Forest Service, Burnihat containing the talents, efforts, hopes and expectations and covering a variety of subjects in the field of forestry.

The Editorial Board expresses its gratitude to the respected principal Shri. N. Luikham sir IFS for final editing articles and faculty Shri. C. A. Rahman sir IFS, Shri. Ajay Rijak sir (PT & GI) for their cooperation and encouragement for bringing out the issue within short time.

My sincere thanks to Director of Forest Education, Principal Chief Conservator and Managing Director of Maharashtra Forest Development Corporation, Principal Chief Conservator of Tripura and Regional Director of National Institute of Rural Development and Panchayati Raj, Guwahati, Assam for their valuable messages through which they have expressed their keen interest on training course.

I extend my sincere thanks to CASFOS Association Members, Office Staff, Advertisers, Readers and All RFO Trainees of 2014-15 & 2015-16 Batch for extending their help and cooperation who have worked together to shape the annual magazine.

I also extend my gratitude towards Ratnajit Chakma RFO Trainee of 2015-16 Batch for designing Academy website through which e-magazine will be made available for keen readers.



Aniket Mote
Magazine Secretary
RFO Trainee
2014-15 Batch

CASFOS ASSOCIATION



Mr. N. Luikham IFS
Principal



Mr. N. Luikham IFS
Lecturer



Mr. C. A. Rahman IFS
Lecturer



Mr. Ajay Rajak
P.T. & Games Instructor



Ruturaj Bartakke
General Secretary



Pezaneinuo Chielle
Asstt. General Secretary



Aniket Mote
Magazine Secretary



Lansoithung Lotha
Sports Secretary



Ganesh Gurav
Hostel Secretary



Rupesh Patil
Cultural Secretary



Pramod Thombal
Mess Secretary



Trupti Thakur
Treasurer

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Patron, Chief Editor



Ruturaj Bartakke
Trainee Editor



Mr. ANIKET MOTE
Magazine Secretary



Miss PEZANEINUO CHIELIE
Trainee Editor



Mr. RAMKISHAN KADAM
Trainee Editor



Mr. PRAVIN DAMALE
Trainee Editor



Mr. JAI PRAKASH MISHRA
Trainee Editor



Mr. DHIRAJ SINGH PARDESHI
Trainee Editor



Ms. KALPANA CHINCHKHEDE
Trainee Editor



MR. SUMAN BHOWMIK
Trainee Editor



Mr. RATNAJIT CHAKMA
Trainee Editor



Staff Members of Central Academy for State Forest Service, Burnihat, Assam with Hon'ble DFE



Central Academy for State Forest Service Association Members with Ex-Principal Sri M.K. Palit Sir

ODE TO CASFOS BURNIHAT

A K Painuly

RFO Trainee [2015-16 Batch.]

Toiling efforts bore fruits,
Cherished dreams come true,
One fine morning they said, "go forest!"
And ecstasy through

Way to forest albeit Burnihat,
The CASFOS in the North-Eastern part.
Producing forester since 1976,
Earning laurels in the forestry world.

Takes trainees in folds warmly,
It's easy, comfortable and homely.
Officers are shaped with care and affection,
Bound to carve out the perfection.

Blessed with choicest faculties,
Less in numbers, not in qualities.
Luikham sir, as calm as Pacific,
Has plenty of pearls, gather as much as one can pick.

Rahman sir deals in smile,
Keep smiles and makes smiles.
The scholar rich in experience and exposure,
Unique, lucid and versatile.

Ajay sir and his whistle keeps trainees on toe,
'Frog Jump', 'Duck Walk' are the daily show.
The robust man keeps everyone remind,
Only a healthy body poses a sound mind.

Four passed fourteen to go,
And we will miss you, O' my almamater.
I wish we could take you along,
To our highlands altogether.

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ANNUAL REPORT

(2014-2015)

CASFOS Association Burnihat
Burnihat, Assam

Mr. Rutaraj Bartakke

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 2014-15 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 into all the needs of the trainees, help them to inculcate managerial and officer like qualities 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 CASFO 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 CASFO 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 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 2014-2015.

Sl. No	Name	Designation
1.	Mr. Rutaraj Bartakke	General Secretary
2.	Ms. Pezaneinuo Chielie	Asst. General Secretary
3.	Mr. Aniket Mote	Magazine Secretary
4.	Ms. Trupti Thakur	Treasurer
5.	Mr. Pramod Thombal	Mess Secretary
6.	Mr. Ganesh Gurav	Hostel Secretary
7.	Mr. Rupesh Patil	Cultural Secretary
		Sports Secretary

ACTIVITIES DURING 2014-15

Range Forest Officer training for the batch of 2014-2015 commenced on 1st March 2014 and passing out will take place on 29th August 2015. The issue of the magazine is being brought out at the time of convocation of batch 2014-2015. The present office bearers of the association assumed charge in August 2015. In this tenure of one year the Association reached many milestones.

Mr. Rupesh Patil, Cultural Secretary

Understanding the culture of a nation, people or group the art, belief, custom, practice, value and social behaviour, is an essential part of the education/training programme. 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 whole. Keeping in view the cultural diversity of the trainees from different regions of the country, CASFOS Association grabbed the opportunity by organising two major events and many small celebrations in due course. First event being the farewell night for our senior batch 2013-14 "AU REVOIR - the end of the beginning" on dated 15th December 2014. This programme was attended by Shri. Omkar Singh, S, PCCF (HoFF) of Arunachal Pradesh, Shri. N. Anzalian, IFS (DFE), Principal and all faculty members along with their family members and staff. This event only made bonding between both batches stronger. Second event came as fresher's night to fresh faces of 2015-16 RFO Trainee batch titled "HAGOTOM- warm welcome" on 5th May 2015. The event was decorated with mesmerizing performance from both the batches. It served as platform for local children to show talent of their group called Green Image. We also celebrated festivals like Holi, Dussera, Christmas, Dewali and New Year. Our Association also organised farewell function on the occasion of retirement of Shri M.K. Palit, IFS, Principal on 28th January 2015.

Mr. Ganesh Gurav, Hostel Secretary

In India from 2nd Oct 2014' our honorable Prime Minister Shri.NarendraModi started "

Swacchha Bharat Abhiyan" to maintain clean and healthy environment of our country. To follow this Clean India Mission we all RFO trainees started it in CASFOS, Burnihat hostel premises.

On the occasion of World Environment Day '5th June, 2015' seedlings of different species are planted in Hostel and Academy premises under the guidance of Shri. N. K. Luikham sir and Shri.C. A. Rahman Sir (IFS), Faculty in CASFOS Burnihat.

Development of good mind, body and soul starts from a good healthy ambience and accommodation. During our tenure a new generator was installed for the hostel. 30 no. new bucket and 60 no. new wall mirrors were provided to the trainees.

Complete renovation of both blocks of Hostel was carried out. Gymnasium room, Table tennis room were also renovated during our tenure.

In order to upgrade and refresh our knowledge and to have information about the world Hostel has been provided with three English and Assamese newspapers along with a monthly magazine. In order to provide new gym instruments in the Hostel a proposal is under process

Complaints regarding water and electricity has been taken due care by staff concerned well within time. The cleanliness of hostel premises as well as chlorination of water tanks and other water sources and drains were carried out from time to time by the concerned staff.

In concise lot of activities regarding improvement, maintenance of hostel has been carried out thus improving living conditions in the hostel.

Mr. Pramod Thombal, 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. VOLTAS Chest freezer has been installed in mess for freezing and maintenance of Texture of perishable items. Also fibre plates, steel jugs and banquet catering utensils were purchased during my tenure to serve the trainees well. Beside this digital weighing

machine has been installed in mess to ensure transparency for issuance of stock in mess. I personally thank respected principals sir for this.

For the first time 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. Lansothung Lotha, Sports Secretary

In this age of globalization where our lives have been restricted to computers and other mundane matters, sport and games make us disciplined, responsible, confident progressive and friendly. Likewise the 20th Annual Sport Meet, 2015 was organized under the theme "MAXIMUS" - strength and greatness- at Lakshmibai National Institute of Physical Education, Tapesia, Sonapur, Assam from 11th to 14th August, 2015. The RFO trainees of both the

batches 2014-15 & 2015-16 were divided into four teams namely - Blue Jay, Rhino, Hornbill and Tige. The events which were held in the Sport meet included - 100m Race, High jump, Long jump, Discus throw and Shot put for both men and women. Volley Ball, Football, Basketball, Cricket, Badminton, Table Tennis, Carom board and Chess. Besides this trainees also participated in the Annual All India Forest Sports Meet. Cricket and Volley ball matches were also organized between junior and senior batch in the month of March. Thus, the training period explores the hidden talents and energy of the trainees and prepares them to be physically and mentally fit for the challenging career ahead. T-shirts are provided to all RFO trainees of both the batches as a part of sports kit to be used in sports.

FAREWELLS AND WELCOMES

During past one year CASFOS Association gave splendid farewell to Principal Shri M.K. Patil Sir in February, 2015. At the same time Association had privilege to host and welcome number of guest lecturers in the Academy who imparted the valuable knowledge to the trainees.



If you fail, never give up because
F.A.I.L. means "First Attempt In Learning"
 End is not the end, in fact
E.N.D. means "Effort Never Dies"
 If you get No as an answer, Remember
N.O. means "Next Opportunity"
 So let's be positive

**Late Dr. A. P. J. Abdul Kalam
 Bharat Ratna**



11th President of India
 (25 July 2002- 25 July 2007)

Name: Avul Pakir Jainulabdeen Abdul Kalam
 Born: 15th October 1931, Rameswaram, Tamil Nadu, India.
 Death: 27th July 2015 (aged 83), Shillong, Meghalay, India.
 Alma Mater: St. Joseph's College, Tiruchirapalli, Madras Institute of Technology.
 Profession: Aerospace Scientist, Author, Professor.
 As a scientist: 1960 as a scientist in DRDO.
 1969 as space scientist in ISRO.
 1969 as Project Director of SLV.
 1970 as a Project Director of Project Devil and Project Valiant.
 1982 as the Chief Executive of IGMDP (Agni and Prithvi Missile Developed).
 1992 as the Chief Scientist Advisor of Prime Minister.

As a President: Kalam was affectionately known as the people's president.
 Kalam was criticised for his inaction in deciding the fate of 20 out of the 21 mercy petition submitted to him during his tenure.

He supported the need of Uniform Civil Code in India.
 Post Presidency: After leaving office Kalam became a visiting professor at the IIM Shillong, IIM Ahmedabad, IIM Indore, BHU and Anna University and an honorary fellow of IIS Bangalore.

Books: Wings of Fire,
 Ignited Minds,
 2020- A Vision for the New Millenium

Thoughts: "Dream is not that which you see while sleeping it is something that does not let you sleep".
 "If you want to shine like sun. First burn like a sun".
 "Without you're an involvement you can't succeed. With your involvement you can't fail".
 "All birds find shelter during a rain. But eagle avoids rain by flying above the clouds"

Awards and honours:

Year of Award or Honour	Name of Award or Honour	Awarding Organisation
1981	Padma Bhushan	Govt. of India
1990	Padma Vibhushan	Govt. of India
1997	Bharat Ratna	Govt. of India
2000	Ramanujan Award	Always Research Centre, Chennai
2007	Honorary Doctorate of Science & Technology	Carnegie Mellon University
2007	King Charles II Medal	Royal Society of UK
2009	Hoover Medal	ASME Foundation, USA
2012	Doctorate of Law	Simon Fraser University
2014	Doctorate of Science	Edinbergh University

Compiled by
Rupesh Patil

RFO Trainee, 2014-15 Batch



Blue Mormon – State Insect of Maharashtra

Jagdish Parhad
RFO Trainee, 2014-15 Batch

Maharashtra has become the first state in country to have a “state insect – Blue mormon butterfly”. It has accorded the status to “Blue mormon” (*Papilio polymnestor*). Maharashtra is one of 225 varieties of butterflies and account for 15% of countries estimated butterfly population. Blue mormon second largest in size among all butterflies, second only to southern bird wing. To conserve butterflies in Maharashtra, Blue mormon was declared as the state butterfly. Butterflies are interrelated with plants, hence they are important insects.

Blue Mormon-Scientific Classification:

- Kingdom- Animalia
- Phylum- Arthrooda
- Class- insect
- Order- Lepidoptera
- Family- Papilionidae
- Genus – Papilio
- Species – Polymenstor.

Distribution –

Endemic to India and Srilanka. In India it is restricted to western ghats, southern India, coastal belts of India. It is occasionally spotted in inland vidarbha and Western Maharashtra.

Status –

The insect is common and not thought to be threatened. It occurs throughout the year but are common in monsoon.

Description –

It has vavlet like black wings with bright blue spots. The fore wings are black in the middle of wings there is a light blue area, which

is divided by black veins or strips. The lower ends of wings are black while the body has some red spots over one side. The hind wings are light blue and have shallow tail. The margin is rigid and black. In middle of wing there is a chain of black spots.

Antennae, head, thorax and abdomen is blackish brown. The females has not the nice light blue colors, they are bluish and grey.

Habitat –

Most commonly in heavy rainfall areas, such as evergreen forest. Also common in deciduous forest and wooded urban areas primarily due to cultivation of its host plant i.e. citrus species. Blue mormon shows eggs, caterpillar and pupal stages of metamorphosis. The larva feed on small rutaceous forest trees and large shrubs.

Host plants –

Citrus grandis (pomelo), Citrus limon (lemon), Paramignamonophyla (climbing atalantia), Glycosmisarboorea and other citrus cultivars.

Life Cycle –

Eggs –

The eggs are laid singly on the upper surfaces of the leaves on rutaceous plant. The newly laid egg is spherical and light green but darken over a time to orange yellow.

Caterpillar –

The new born caterpillar makes the egg shell its first meal and then rest on silken bed that it spines for itself near the edge of the leaf. The little caterpillar mimics a bird dropping with its



olive green body and white 'uric acid' making. The sheen enhances its resemblance to fresh bird droppings, later its growing size forces it to keep to twigs and the underside of leaves except when it is feeding on leaves.

Pupa -

The pupa resembles that of the common mormon but it is much larger in size and can be easily distinguished by the prominent folds on the lower side of the abdominal position.

Why Conservation of butterfly needed -

1. Important component of the rich biodiversity
2. Butterflies will improve the whole environment for wildlife and enrich the lives of people now and in future.
3. Aesthetic value
4. Extremely important for scientific studies on climate change
5. Eco - tourism benefits
6. Plant pollinator in local environment.



How to measure Plant Biodiversity.....

Aniket Mote
RFO Trainee, 2014-15 Batch

$$R = \frac{S - 1}{\log N}$$

Where,

R = Species richness index

S = Total number of species

N = Total number of individuals of all the species.

Important Value Index(IVI):

It is the sum of all the relative density, relative frequency and relative dominance for each species.

Important Value Index (IVI) gives the total picture of socio-ecological structure of species in a community. It is an integrated measure of relative frequency, relative dominance and relative density. Important Value Index (IVI) represents the overall vegetation characteristics of an area. The IVI of the species indicates its dominance, ecological success its good power of regeneration and greater ecological amplitude.

Important Value Index is the sum of all the relative density, relative frequency and relative dominance for each species. This has been developed by Curtis and McIntosh (1951) is represented as the important Value Index (IVI).

Relative Density (R.D) =

$$\frac{\text{(No. of individuals of a species)}}{\text{(No. of individuals of all the species)}} \times 100$$

Relative Dominance (R.D) =

$$\frac{\text{Total basal area of a species}}{\text{Total basal area of all the species}} \times 100$$

Relative Frequencies (R.F) =

$$\frac{\text{Frequency of the species}}{\text{Total frequency of all the species}} \times 100$$

The word "Biodiversity" has become the talk of the 21st century both at home and abroad. In simple words, Biodiversity is the variability among the living organisms such as plants and animals. Biological diversity is necessary for human survival and economic well being as it provides food, medicine, industrial raw material and offers potential for providing many yet unknown benefits to future generation. The impact of climate change on biodiversity and the importance of its conservation thus becomes crucial especially for a country like ours, which stands 7th in the biodiversity richness in the world. In order to take up measures for conservation, we need to have some basis to measure these resources. However, very few people are aware about such measurements.

There are some biodiversity indices which are used to measure the biodiversity, these biodiversity indices used to calculate the biodiversity, which is discussed as follows:

Data collection

is the first and important step in the measurement of plant biodiversity, some methods of data collection of vegetation may be listed as -

- I. Transect method
 - Line transect, Bisect transect, Belt transect
- II. Loop method
- III. Quadrate method
 - List quadrates, Count quadrates, Chart quadrates, etc
- IV. Point methods
 - Point frame and point centered quarter methods

Biodiversity Indices vSpecies richness: Species richness is a measure of the number of species

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Shannon diversity index:

It is one of the biodiversity indices which measure the heterogeneity i.e. species diversity in a sample. It is most widely used index in community ecology. The Shannon's index assumes that individuals are randomly sampled from an indefinitely large population and all the species are represented in a sample. The species diversity of the different regions was calculated by using Shannon -Wiener information index (Shannon and Weiner - 1963) and is estimated by using the formulae:

$$H = \sum_{t=1}^s \left(\frac{n_i}{N} \right) \log_e \left(\frac{N}{n_i} \right)$$

Where,

H = Shannon and Wiener index.

s = number of species.

n_i = number of individuals in the ith species.

N = total number of individuals from the selected species

Simpson dominance index:

It is one of the biodiversity indices which assess the dominance of species in the biodiversity. Simpson's index is a measure of dominance since it weighted towards the abundance of commonest species. Simpson (1949) gave the probability of any two individuals drawn at random from an infinite large community belonging to different species.

$$D = \sum_{i=1}^s \left(\frac{n_i}{N} \right)^2$$

Where,

s = number of species.

n_i = number of individuals in the ith species.

N = total number of individuals from the selected species.

Reference - Impact of Developmental Activities on the Floral Biodiversity of Narnala Wildlife Sanctuary, Msc Thesis by Aniket Mote



Importance of Mangrove Ecosystem for Mankind

Ruturaj Bartakke
RFO Trainee, 2014-15 Batch

- Mangrove forests are extremely important coastal resources, which are vital to our socio-economic development. A vast majority of human population lives in coastal area, and most communities depend on local resources for their well-being. The mangroves are sources of highly valued commercial products and fishery resources and also as sites for developing burgeoning eco-tourism. The mangrove forests have been shown to sustain more than 70 direct human activities, ranging from fuel-wood collection to fisheries.
- Mangrove forests are extremely important coastal resources, which are vital to our socio-economic development. A vast majority of human population lives in coastal area, and most communities depend on local resources for their well-being. The mangroves are sources of highly valued commercial products and fishery resources and also as sites for developing burgeoning eco-tourism. The mangrove forests have been shown to sustain more than 70 direct human activities, ranging from fuel-wood collection to fisheries.
- In the oligohaline zone, the salinity is reduced further to 0.5 ppt to 5ppt as a result of more freshwater influx. Its substratum is silty.
- The limnatic zone is almost fresh water with occasional intrusion of brackish water at the highest high tides. The salinity in this area is less than 0.5 ppt and the substratum is full of gravel and coarse grains of sand.

SOME IMPORTANT SERVICES RENDERED BY MANGROVES

Ecological Services

Much of the ecological service of mangroves lies in protecting the coast from solar UV-B radiation, 'green house' effects, and fury of cyclones, floods, sea level rise, wave action and coastal erosion. Mangrove swamps act as traps for the sediments, and sink for the nutrients. The root systems of the plants keep the substrate firm, and thus contribute to a lasting stability of the coast. The ecosystem provides a source of food, breeding grounds and nurseries for many food fishes and shellfishes, and they do very often encourage and attract other kinds of wildlife.

They further help in offering protection to other associated flora and fauna of the ecosystems including the islands. The mangrove ecosystems are highly productive and comparable to good agricultural land. Benefits of mangroves are 25 fold higher than that of paddy cultivation.

Screening the solar UV-B radiation

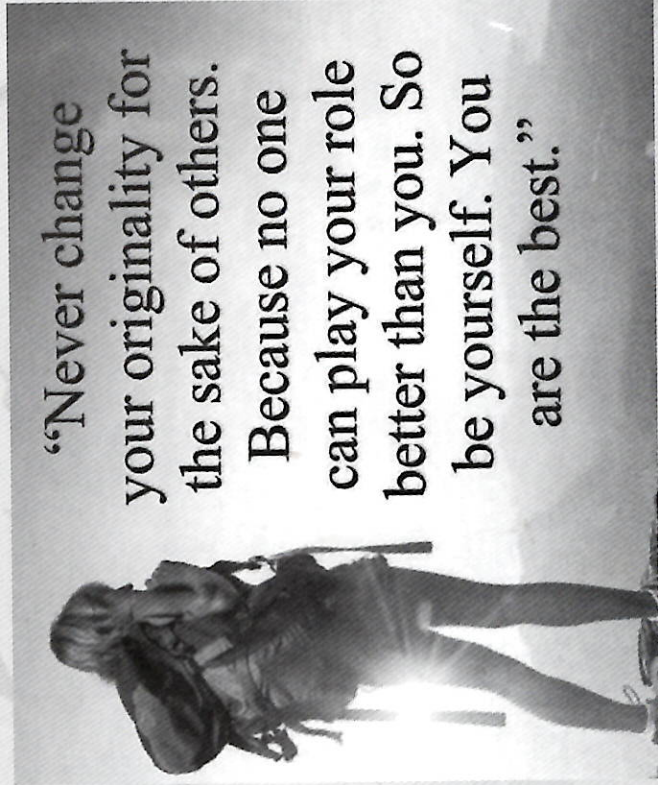
Mangroves possess mechanisms to deal with intense sunlight rays and solar UV-B radiation. For example, *Avicennia* species grow in areas endowed with high sunlight, hot and dry conditions and the species are well adapted to

Formation in mangrove ecosystem

On the basis of salinity, five zones - euhaline, polyhaline, mesohaline, oligohaline and limnatic zones - of mangrove distribution are considered. The west coast is characterized by the rocky substratum and hence absence of mangroves in the mouth region. On the other hand, the same euhaline zone along the estuaries of the east coast, which is a delta region, shows the presence of luxuriant mangrove forests as observed in the Gangetic, Mahanadi and Godavari deltas.

• In the euhaline zone, the salinity ranges from 30 ppt to 40 ppt. Wave action is maximum and the gradient is not steep; thus sediment accretion will take place in the region of influence which is known as delta. Otherwise, the entire sediment load will be washed into the

• The polyhaline region, characterized by salinity range of 18 ppt to 30 ppt, has a low wave action and substratum is sandy clay. The euhaline region, with 5 ppt and 18 ppt salinity, has silty clay bottom and feeble wave action.



“Never change your originality for the sake of others. Because no one can play your role better than you. So be yourself. You are the best.”

arid zones. Rhizophoracean species show greater solar UV-B tolerance than do other mangrove species. The mangrove foliage produces Bflavonoids that serve as UV-screen compounds. This ability of mangroves makes the environment free from the deleterious effects of UV-B radiation.

Trapping the sediments

One of the important functions of mangroves is trapping of sediment, and thus acting as sinks to the suspended sediments. The mangrove trees catch sediments by their complex aerial root systems and thus function as land expanders. In numerous cases, there has been proof of annual sedimentation rate, ranging between 1 and 8 mm, in mangrove areas with expansion of land has a different view that the mangrove forests are the result, and not the cause of sedimentation in protected coastal areas, and that they accelerate the role of sedimentation process. This depends largely on the complexities involved in the exchange process taking place between mangroves and the adjoining coastal areas. The mangrove structures inhibit tidal flows, probably due to the friction force which the trees with their root system provide. The soil particles are carried in suspension into mangrove forests from seawater by the incoming tide, and the soil particles are left behind in the swamps and within the root system by the outgoing tides. Thus, the particles settle in the forests during the low tide, probably when the turbulence gets reduced and water velocity at low tide becomes sluggish and low to carry the particles back to the sea. It has been estimated that mangroves help in trapping the sediment up to 25% at low tide as compared to high tide. This high efficiency of trapping suspended sediment may be attributed to wide spread occurrence of numerous respiratory roots in *Avicennia* and to

compactly arching stilt roots of *Rhizophora*. The density of mangrove species and their complexity of root systems thus constitute most important factors, for determining the sedimentation process.

Supporting the fishes and wildlife populations

Mangrove ecosystems are important for fish production. They serve as nursery, feeding and breeding grounds for many fishes and shellfishes. Nearly 80% of the fish catches are directly or indirectly dependent on mangrove and other coastal ecosystems worldwide. It is widely believed that the mangroves are like the roots of the sea and, if there are no mangrove forests along the coast, there will be either no fish or fewer fish in the sea and the sea will act like a tree without roots. Besides fish, the mangroves support a variety of wildlife such as the Bengal tiger, crocodiles, deer, pigs, snakes, fishing cats, insects and birds. The detached parts of the mangrove plants when fall on the floor are called 'litter-fall'. These include leaves, stems, roots, flowers and fruits. Microorganisms found in the soil decompose the fallen parts. During this process nutrients are released which enrich the surrounding waters. The decomposed organic matter along with microbial biomass is known as detritus. This is an important product produced in the mangrove ecosystems. It is rich in protein and it serves as a nutritious food for a variety of organisms. The organisms feed on detritus filter the detritus-particles from the water column. Such detritus-feeding fishes are preyed upon by larger carnivorous forms. The influx of nutrients generated by the mangroves supports other sensitive habitats like the coral reefs, seaweeds and sea grass beds. Detritus largely consists of both living and inert materials in suspension, which continuously settles to the bottom. Thus mangroves become a very

important source for maintaining the carbon budget, sustaining microbial food chain and recycling nutrients in the estuarine complex.

Controlling the flood

Mangrove systems offer protection to the coastline against the flood, which are often caused by waves or due to heavy rainfall associated with storms. The ability of mangroves in flood control is to the response of their root system to have a larger spread out in areas prone to tidal inundation, their roots to promote sedimentation. Besides flood control, the mangroves prevent the entry of water inland and thus protecting the underground water systems, forming a source of drinking water or supply to coastal population. Very often very sharp changes have been noticed in salt concentrations of ground water at the interface between salt flats and mangroves. This suggests that mangrove systems can modify the salinity of the ground water by lowering it drastically.

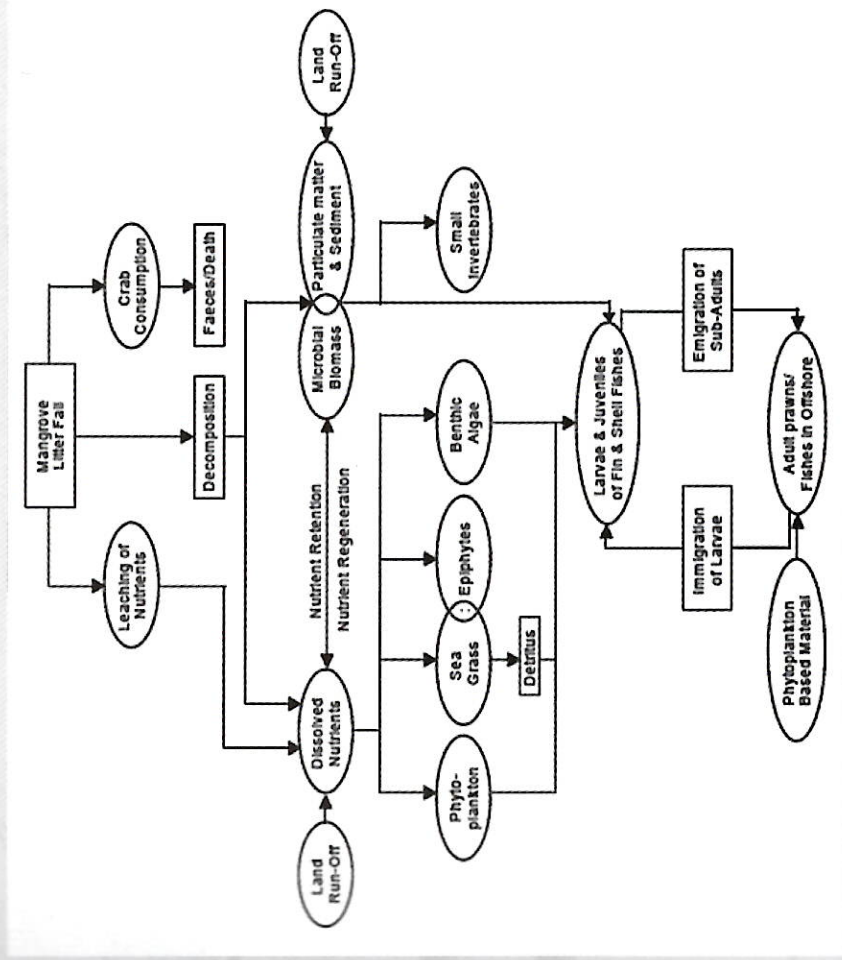


Fig: Food web in mangrove ecosystem

Arundel, J.E. and Thampanya, U. (2006). Mangroves mitigate damage: a further response. *Estuarine Coastal and Shelf Science*, 67:1-3.
 Wong, Y.S., Lam, C.Y., Che, S.H., Li, X.R. and Tam, N.F.Y. (1995). Effect of wastewater discharge on nutrient contamination of mangrove soil and plants. *Hydrobiologia*, 295: 243-254.
 Arundel, N. and Kathiresan, K. (1999a). Do decomposing leaves of mangroves attract fishes? *Current Science*, 77(7): 972-976.

One of the very important characteristics of a student is to question. Let the students ask questions.



NTFP Marketing in India- A Concern

Ms. Pezaneinuo Chie
RFO Trainee 2014-15 B

About 100 million people especially those living in and around forest areas depend on NTFPs for their living. Besides other requirements fulfilled by the NTFPs, studies have shown that 10-70% of the income of these households comes from NTFPs. Thus the contribution of NTFPs to rural livelihoods is an important ingredient in alleviating rural poverty. In many states, NTFPs also contribute to a major proportion of the revenue to the State Forest Departments. For instance, >70% of revenue to the Odisha Forest Department was from NTFP and > 75% of traded NTFPs in India comes from the states of M.P, Chattisgarh, Odisha, Maharashtra and Andhra Pradesh.

However these facts remained overshadowed because of the sector's unorganized nature.

Concerns for the dawdling of the NTFP sector are mentioned here:

- NTFP trade generally based on misinformation and lack of organized data because of high degree of source heterogeneity, production system characteristics and utilization
- Due to geographical limitations, primary collectors cannot sell their goods directly to end consumers and therefore the supply chain involves many agents such as traders, retailers, suppliers, etc resulting in price recovery to the primary collectors

Poor availability of marketing information. Due to socio political situations, especially NTFPs rich states like M.P, Chattisgarh, Odisha, Andhra Pradesh and Maharashtra; it becomes easier for the unscrupulous traders to operate fully in the market and the states are often unable to play an effective role.

Within the Forest Departments, the have hardly access to or in some cases, not enough interest is given towards NTFPs (more priority being given to other forest policies like plantation rehabilitation, wildlife management, timber marketing, etc)

NTFP marketing not supply or demand driven but by informal market players.

Seasonality of the product leading to price swings.

Lack of scientific quality parameters.

Issues and the way ahead:

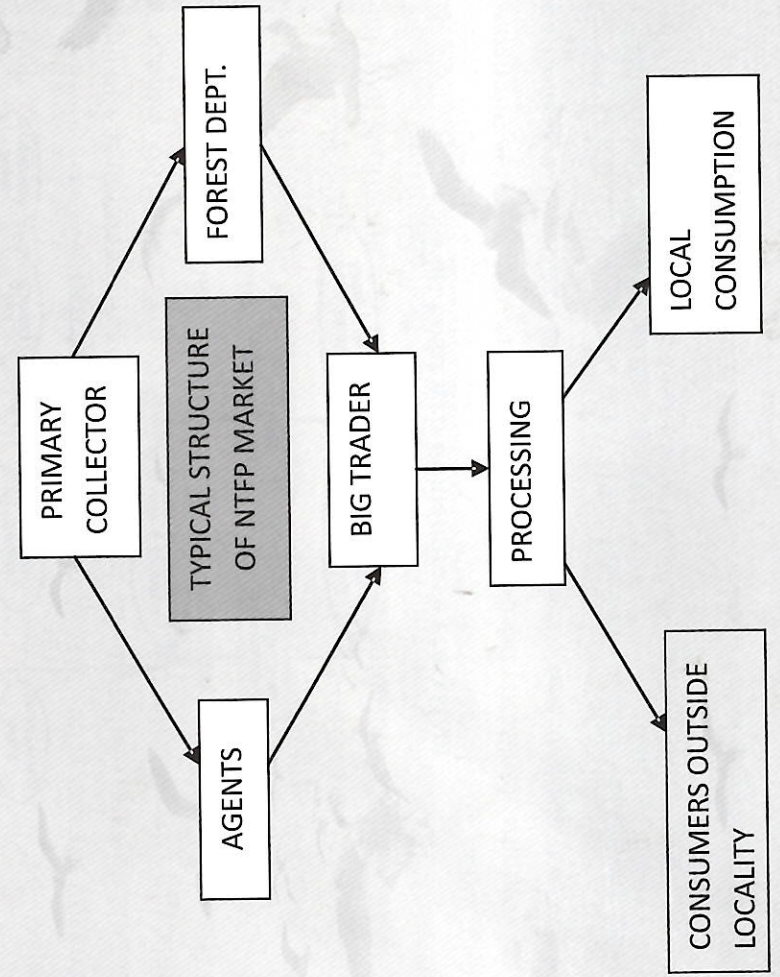
Fill up the big lacuna that exists in NTFP marketing include- a fair price recovery to the primary collectors, they being the primary holders of the resource. The ST and OTFD (Recognition of Forest Rights) Act, 2006 gives the right of ownership and management of NTFP to tribal people and forest dwellers. Policies on these lines are necessary for providing the real value of such resources to the primary collectors. A mere fair return is not a function of price

alone because, a higher return per unit price will draw more people into NTFP collection which may hinder the objective of sustainability by ecologically unsustainable removals. Therefore, the strategy should be:

- to enhance the efficiency of the supply chain that will result in better return,
- less wastage,
- better market information,
- more value addition opportunities and
- access to R&D and original inputs.

The main aim should be to move from being a highly unregulated to being a fair and regulated market. For this, a proper market regulation is essential and calls for an overall co-ordination of the various issues relating to NTFP marketing. A national body is necessary not only from policy and pragmatic initiatives but also to provide financial resources for management and development of the NTFP sector.

Therefore, keeping sustainability at the core of marketing and developmental objectives, the potentialities of the NTFPs should be cashed upon to the maximum possible, as this will not only improve the revenue generation of the Forestry sector (in the bigger picture), but also the fruits of NTFP marketing will reach down to the primary collectors who indeed form the most important element in the entire marketing regime.



Let me define a leader. He must have vision and passion and not be afraid of any problem. Instead, he should know how to defeat it. Most importantly, he must work with integrity.

Personal Protection in an Earthquake Before an Earthquake

Ramkishan Kadam & Pappu Singh Wasth
RFO Trainee, 2014-15 B

As a Citizen -

- Follow local safe building codes (Earthquake Resistant Construction) and advocate its enforcement in Earthquake Prone Areas.
- Support the community effort to replace or remove old weak building or structures.
- Encourage and participate in earthquake drills or training sessions.
- Learn first aid.
- Identify the medical centres, firefighting stations, police posts or any organized relief society of your area in advance.
- Keep immunization upto date for all family members.

At Home -

- Know the location of main electric fuse box, gas and water shut off valves of your residence. Responsible members in family must know their operations.
- Procure battery powered radio, torches and first aid kit. Make sure everyone knows their storage places. Keep batteries at most convenient places.
- Store containers of dangerous materials, such as flammable liquids and poisons, in secure place where they cannot fall and break open.
- Secure, fasten or bolt down heavy appliances to the floor and do not keep heavy object unsupported on the high shelves. Keep cupboards and cabinets

At work

- Do not hang picture frames or mirror over beds. Locate beds away from windows. Do not put hanging plants or light fixtures where they can swing and hit a window come off their hooks.
- Use flexible gas and hot water connections wherever possible.
- Keep a few days of nonperishable food in your home. If you take medicine regularly, have an extra supply on hand.

At School

- Ask the teachers to discuss earthquake safety in class room and attend drills earthquake protection.

DURING AN EARTHQUAKE

If you are Indoors

- Stay calm and reassure others.
- Do not run outside during shaking.
- Drop down onto your hands and knees.
- Stay away from mirrors, windows and outside doors.
- Try to stand against a wall near the center of building, or get under a table or a wooden cot (away from windows).
- If in school get under the desks, facing away from windows.
- Do not stand in a doorway.
- If in a crowded store (such as shopping

complexes, malls, cinema hall etc) evacuate only if told so. Choose your exits carefully as possible use stairs rather than elevators.

you are Outdoors

- Stay away from overhead electric wires or anything that might fall (such as building, chimneys, balconies, power pole and other projections).
- If you are in a moving car, stop as quickly and safely as possible.
- If in a moving vehicle, stop away from bridges, overpasses and remain inside the vehicle (in case of car) until shaking is over.
- When you drive on, watch for hazards created by the earthquake.
- If you are on playground, stay away from buildings.

IF YOU ARE OUTDOORS

- Check yourself and people nearby for injuries. Provide first aid if needed. Do not attempt to remove seriously injured people unless they are in immediate danger.
- Wear shoes and gloves in all areas near debris or broken glass. Check water, gas and electric lines and fittings. If damaged shut off the main valves.
- Avoid downed power lines or objects touched by the downed wires.
- Immediately clean up spilled medicine, drugs and other potentially harmful material.
- Check for fire or fire hazards
- Do not use matches or open flames until

you are sure that there is no gas leak. Do not operate electric switches or appliances if gas leak is suspected.

- Check chimney, parapet and balcony carefully for any cracks and stay out of damaged building.
- Open closet and cupboard doors carefully as the objects may fall down on you.
- Use battery operated radio and T.V. for emergency instructions. Do not use telephone as it will be needed for high priority (such as rescue, help and medical) messages.
- Do not flush toilets until sewer lines are checked.
- Do not spread rumors as these can cause panics.
- Respond to requests for help from police, fire fighting, civil defiance, and relief organizations.
- Do not go for sightseeing. Stay away from beaches and water front areas where tsunamis could strike, even long after their earthquake shocks.
- Do not go into damaged area unless your help has been asked. Material law against looters has been declared after a number of earthquakes.
- Generally the earthquakes of greater magnitude are followed by small earthquakes. Be prepared for aftershocks and additional damage.

Reference - Wadia Institute of Himalayan Geology, Dehradun.

Man needs his difficulties because they are necessary to enjoy success.

REDD+ & Potential Impacts on India

Pramod Thomb
RFO Trainee, 2014-15

REDD (Reducing Emission from Deforestation & Degradation) is the global endeavour to create an incentive for developing countries to protect, better manage their Forest resources, thus contributing to the global fight against climate change. REDD+ goes beyond merely checking deforestation and forest degradation and includes incentives for positive elements of conservation, sustainable management of forest & enhancement of forest carbon stock (FCS). REDD+ conceptualizes the flow of positive incentive for demonstrated reduction in deforestation or for enhancing the quality & expanse of forest cover.

It works on the basis of creating financial value of carbon stored & enhanced in the biomass in soil of standing forest. Countries that reduce emissions & carbon stock sustainable management of forest will be entitled to receive funds & resources as incentives. The REDD+ approach incorporates important benefit of livelihood improvement, biodiversity conservation & food security service.

India stands to gain a lot of from a global REDD+ mechanism. It has opened possibility for the country to expect compensation for its pro conservation approach & sustainable management of forest resulting in an ever further increase of forest cover & thereby its FCS. The incentives so received from REDD+ would be passed to the local communities involved in protection & management of forest. It is estimated that REDD+ programme for India could provide capture of more than 1 billion of additional CO₂ over the next three decades & more than US\$ 3 billion as carbon service incentive under REDD+.

REDD+ will benefit local communities as it safeguard their right & those of indigenous peoples. India is committed that monetary

benefit from REDD+ will flow to local, forest dependent, forest dwelling & tribal communities

This is ensured by these reason:-

- (1) In the Indian context, REDD+ is intended to be an additional co-benefit to the good service already acquiring to & being enjoyed by the local community, & therefore, it comes as bonus without compromising on existing benefit.
- (2) India's own acts, guidelines, executive instruction & order at the central & state level ensure that REDD+ will not adversely influence the traditional & legal right of local communities over forest, but on the other hand it will ensure more monetary benefit flowing to them.
- (3) All international REDD+ deliberations & negotiations recognize and respect national Legislation relating to safeguards for right of indigenous people & local communities & aim to promote their participation in implementing & monitoring of REDD+ making REDD+ work for India

Key issues & priorities-

- (1) India is not reducing forest cover by area by carbon stock due to forest degradation resulting in loss of biodiversity & ecosystem services.
- (2) Forest conservation & management require an integrated approach & inter-departmental coordination.
- (3) Fostering the dialogue between the central state Governments.
- (4) Government of India should focus on capacity building of local communities.
- (5) Financing at least one pilot study in each state of the country.
- (6) The international community must concentrate to provide adequate operational funds for SMF i.e., maintenance of ecosystem service, conservation of biodiversity ensuring livelihood of forest dependent communities.

Indian Judiciary: It's Role in Forest and Environment Conservation. What's your take?

Lansothing Lotha
RFO Trainee, 2014-15

India, the largest democracy in the world is a unique set up, managing the second largest population of the world in the seventh largest country geographically. Boom in agriculture, industrialization and modern development has put the highlight in the recent times in the country, tuning itself to meet the ever growing demand and requirements of its citizens. This, of course, come with enormous pressure being shifted upon the forests of the country.

The Forest Policy of 1988 also took into account another important factor for the effective conservation of forests-the human component. This policy gave ample provision and encouragement for the participation of individuals and local community which led to the formation of implementing institutions such as the National Wasteland Development Board (NWDB), Joint Forest Management (JFM) and Forest Protection Committees (FPC).

However, a major breakthrough came in the year 1980 with the implementation of an act that would eventually change the future of forests in India and rewrite its history- the Forest (Conservation) Act, 1980. This Act highlighted an important factor for protection- check the conversion of forest lands for non-forestry purpose. Under this Act, no state government could authorize the conversion without the central government approving and permitting it.

With such meticulous Acts and Policies in place, one could conclude that the forests in India were well guarded with a well set up legislative. Yet, the forests of the country continued to not only reel under pressure but also decline in the same trend as before. A close monitoring of the situation would reveal that the reason why the forests of the country couldn't revive even under such powerful legislation was indeed in the implementing institution- the executive. With the continuing lapses at the implementing level

of the use, arguably misuse at most times, of forest resource has become so serious a feat, it called for the intervention of the judiciary, making its role an inseparable part in conserving the resources. The basic mantra of the judiciary to delve into problems of the present and find solutions for it has enabled it find favor with the legislative and executive.

The origin of the legislature can be traced back to as far as the British colonial era with the passing of the first Indian Forest Act in 1865, which was followed by the Forest Act 1878 and then by the Indian Forest Act 1927. The former Acts had a major drawback being heavily production oriented thereby giving ample provision of extraction of forest resources. The or although had some aspect for protection of forests of the country still was not able to completely do away with the unsustainable manner in which forest resources were utilized under the colonial society.

Like in most countries, the executive of the forestry sector is dependent on the Forest Act for its role. These Policies are the provisions that provide the provisions to act on matters concerning forest resource conservation and management. The initial two Forest Acts of 1894 and 1952 were aimed at

the continuing lapses at the implementing level



for varied reasons such as conflict with statutes and opinions between development and conservation goals, the entire system stagnated.

It didn't take too long for the judiciary to step into action and by the mid 1990s, the Supreme Court started taking up forest related issues under its enforcing power, mainly as a result of the lack of interest shown at the implementing level.

In the run up to the present status of judicial activism, one important factor was the Public Interest Litigation (PIL), which is the one factor that created opportunities and opened up doors for the judiciary to intervene. The Godavarman Case 1995 and the Centre for Environmental Law, WWF-India Case 1995 are some of the most conspicuous cases of judicial activism through PIL in the conservation of forests. Details of the cases:

1. The Godavarman Case: TN Godavarman Thirumulpad vs. Union of India and Others
Widely known as the one single case that has "refined and redefined" forestry in India, it represents arguably the single biggest judicial intervention in administration of forests in the country. This petition was filed by TN Godavarman on 07-04-1995 due to large scale illegal felling of timber in the Nilgiri Range of Tamil Nadu. The Supreme Court utilized fully the provisions of Forest Conservation Act, 1980 along with the other Forest Acts and Policies and addressed various vital issues such as ban on felling of trees, ceasing all non-forestry activities throughout the country, constitution of High Power Committee for NE states, Forest Advisory Committee, and the protection of wildlife, National Parks and Sanctuaries. It also defined the term forest. This success led to more other similar cases being tagged with the Godavarman Case.

Climbing to the top demands strength, whether it is to the top of Mount Everest or to the top of your Career.

2. Centre for Environmental Law, WWF-India vs. Union of India

Through this case, the Supreme Court restrained all the State Government from reserving National Parks, Wildlife Sanctuaries forests.

Some other exemplary forest environmental cases where judiciary prevailed with authority are the Damodhar Rao vs. State Municipal Corporation Hyderabad, Ratnawati Municipal Council vs. Vardichand, M. C. Mehta vs. Union of India, Union Carbide Corporation vs. Union of India, Vellore Citizen's Welfare Forum vs. Union of India, M. C. Mehta vs. Kamala Nath Others etc. to name a few.

All in all, the judiciary triumphed where legislature to some extent, and executive particular and to a large extent, have struggled. While the judiciary's commendable role in conservation of forests and environment in country is to be highly appreciated, what we are implementing level should ponder upon is the that perhaps somewhere along the line we failed in executing our part as executive. Perhaps this lacuna has sparked the need for intervention of the judiciary to this level which have been avoided.

The legislature has done its part in setting stringent Acts and Policies for the conservation of the nation's forests. How the judiciary intervenes all depends on how we as executive perform. In doubt, the role of judiciary will be inseparable from forests and environment in order to conserve it. But on which side the case rules, lies on which side we stand. You either become Godavarman or be entangled on the other side.

Shola Forest

Ganesh Gurav
RFO Trainee, 2014-15 Batch

Introduction

Sholas are a local name for patches of stunted montane forest found in valleys in higher altitude regions of South India. The shola forest is usually separated from one another by montane plateaus. The shola and grassland together form the shola-grassland complex has been described as a climatic climax vegetation with forest cover and expansion restricted by climatic conditions such as forest soil characteristics.

Distribution and Origin -

Shola forests are found in the higher altitude regions of the Nilgiris, Kanyakumari district, western ghats and associated ranges in states Karnataka, Kerala and Tamilnadu. Shola forest is found at 1600 mts elevation in many hilly areas e.g. Bilgiriiranga hills.

The origin of shola forest and grassland complex has been the subject of scientific debate; by researcher suggested that the floristic composition represents climax vegetation. The shola being maintained by climatic condition has forest which allow the grass to grow but kill any forest seedlings, pollen analysis from bogs in Nilgiri suggest that the complex of grassland forest existed 35,000 years ago, long before human impact began.

Shola forest are home to many threatened endemic species. The western ghats are one of the biodiversity hot spot. The larger animals inhabiting a shola-grassland mosaic are Tigers, leopards, elephant, gaur. The endangered Nilgiri langur is endemic to the shola grassland.

Laughingthrushes, Nilgiri wood pigeon and some of the endemic flycatchers are some of the 300+ species of birds inhabit this area.

Flora -

At least 25 types of forest trees are present in the major shoals of the Nilgiri hills. The dominant tree species are *Michelia nilgirica*, *Bischofia javanica*, *Eugenia* spp., *Cedrela toona*, *Ficus glomerata* etc. Shola forest have an upper story of small trees generally *Pygeum garderi*, *Linociera ramiflora*, *Syzygium spp.*, *Mahonia nepalensis*, *Litsea weightiana*.

Grassland species characterized by frost and fire resistance such as *Chrysopogon zeylanicus*, *Cymbopogon flexuosus*, *Arundinella ciliata*, *Themeda tremula* and *Setima nervosum*.

Threats:

Invasive introduced species are serious threat to this high altitude ecosystem. Some like *Acacia mearnsii* and *Eucalyptus globules* are the consequence of commercial plantation afforestation drives, other threatening invasive includes *Lantana camera* & *Ageratina adenophora*.

Conservation -

Periodic fires have been considered to help maintain the grassland, however excessive burning has led to a shrinkage of forest patches and the growth of invasive species.

The shola biome have a high water retention capacity & exists as the precious source of water for the high altitude organisms are the origin of many streams and rivers in the western ghats.

We should not give up and we should not allow the problem to defeat us.



A Success Story

Do you know the decline of which species has cost India 34 billion US dollars? The decline of this species has been recorded as the most rapid decline in history of a large population. In the 1980s, one of the sub-species was considered as the most numerous species of raptor in the world, with around 80 million individuals, but today, however, its population numbers only several thousand. These birds of prey are one of the most efficient scavengers, constituting India's optimal natural animal disposal system. They live in communities and mostly near human habitation. For the deceased Parsi to reach heaven, these species serve as intermediaries between earth and sky. The dead body is placed on a Tower of Silence where these birds by consuming the body, liberate the soul. The dwindling population of Parsi Indians, deprived of their celestial emissaries, has been obliged to drop these ancient customs for reasons of hygiene, since now bodies take six months to disappear. I am talking about the VULTURES here.

One can imagine the quantum of acceleration in decline by the facts that the population of White-rumped Vulture (*Gyps bengalensis*) fell 99.7% between 1993 and 2002. The populations of the Indian Vulture or Long-billed Vulture (*Gyps indicus*) and the Slender-billed Vulture (*Gyps tenuirostris*) fell 97.4%. Out of nine species found in India, these three species are in danger of extinction. Researches show that in India, feral dog populations have increased by 30% due to the disappearance of vultures, which consequently has increased the risk of human rabies and anhrax. After much

work on possible viral causes of the decline, culprit was discovered by Dr. Lindsay Oaks and team in 2003: diclofenac. It is a common anti-inflammatory drug administered to livestock and was widely used in India in the 1990s. The drug is fatal to vultures. A vulture is exposed to a moderate dose of diclofenac if it eats from the carcass of a recently treated animal. A simulation model demonstrates that if only 1% of carcasses were contaminated by diclofenac, Indian vultures would be decimated and a study of carcasses showed that 10% were contaminated.

Following research on veterinary diclofenac, the drug was taken off the market in India on March 11, 2006 and a replacement drug, meloxicam, was quickly developed and proposed after tests on vultures in captivity. Meloxicam affects the cattle the same way as diclofenac, but is harmless for vultures. The disappearance of vultures has allowed other species, such as stray dogs, to take their place. These new abundant scavengers, however, are not as efficient as vultures. A vulture's metabolism is a "dead-end" for pathogens, but dogs and become carriers of pathogens. Stray dogs attract leopards to the human inhabited areas which can result into man-animal conflict. Dogs carry diseases like rabies, anthrax, plague, and from rotting carcasses. The statistics show that in India, 30,000 people die from rabies each year. More than half the world's total. A person is bit every 2 seconds and one dies from rabies every 15 minutes. 70% of the victims are children under the age of 15. The Indian government treats 1 million victims each year at a cost of Rs. 1500 per person. The poor citizens do not have access

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RFO Trainee, 2014-15 Batch

care. Moreover, huge sum of money is needed to control the population of stray dogs. I was talking about all these expenditures when I mentioned 34 billion US dollars at the beginning of the story.

Every cloud has a silver lining. I am going to tell you a story of one such silver lining. This story started on 8th October 2013 as a joint effort of the people and the forest department. The place was Kamalapur range, Sironcha Forest Division in Aheri Taluka of Gadchiroli district of Maharashtra, where a group of 12 to 15 individuals was spotted. The first sighting was done by **Mr. Atul Ambhau Deokar**, who got his first posting as a Range Forest Officer in this Range. This was the beginning of a long and exciting story. He along with his team of three Forest Guards, Mr. Kadari, Popball and Mr. Lade started monitoring the site. One nest of White-backed vulture on a teak tree in the same village gave a ray of hope which was kept under regular monitoring with the help of local villagers. They conducted surveys in the villages in the vicinity and discussed with the people about the sightings. The next monitoring spots were the 'Dhorphodi' sites, a common place where dead cattle were put outside the village.

The results of this monitoring by the dedicated Kamalapur staff revealed that the vultures were being badly disturbed by stray dogs while feeding on the carcasses. Little was left by the dogs for the vultures to feed on and the vultures had to wait for their turn to feed. So, the team decided to set up 'Vulture Restaurants'. This restaurant is a 30mx33m structure which is built with chain link with wooden poles. A wooden platform called 'Machan' of 10ftx10ftx3ft is set up inside this fence. Around Rs. 90,000/- was spent to raise one such structure. These restaurants were set up in other ranges as well. In the last year they have raised 11 vulture restaurants. The birds were distributed by the department with

an appeal to bring the dead animal to these restaurants with an assurance of Rs. 250/- per dead body. A format was developed for data collection from each restaurant that would be helpful in any future endeavor to conserve vultures. The staff kept a meticulous record of the account of the villagers bringing the dead animals. They also maintained a proper data along with lat/long of the vulture sightings at these restaurants. These records were regularly maintained by the respective Forest Guard and checked by Range Officers. This gave them a fair idea about the population of vultures in the area. Vultures are territorial and they migrate locally. The whole area was divided into grids for counting of nests. This made the survey more robust.

Participation of the local people was the most important part of the story as they were the ones who provided the food for vultures. In return, the vultures provided them with hygienic environment. The villagers were getting financial benefits too. Moreover, the limelight was on this area as the place of this success story, making the locals proud and happy!

The department started the concept of 'International Vulture Awareness Day' to make people aware about the significance of vultures. This day is celebrated annually on first Saturday of September. Meetings of the staff and the villagers were organized where they were sensitized through discussion, documentaries and the suggestions for the cause were invited. In one such meeting, the idea of "Gidhad Mitra" (Friend of Vulture) was put forth. These individuals support the department in survey, monitoring and creating awareness. The first Gidhad Mitra, Mr. Shrihari Gurjalwal was selected from Kamalapur range.

Now, as the awareness is spreading, people bring injured vultures to the range office



where they are treated by the Livestock Development Officer (LDO). Here, the people do not use diclofenac and the LDO do not prescribe it. But, still the medical stores are kept under regular observation. Besides, awareness regarding the ill impact of diclofenac on vulture existence is being spread. Diclofenac is not a problem in this area. Here, the drug is not used as the tribals do not go for such costly treatments for their unproductive cattle. But, the major problem was the unavailability of sufficient food because of stray dogs. This obstacle was overcome with the introduction of vulture restaurants.

At the beginning the vulture population was just a group of 12-15 birds. Aforementioned conservation efforts resulted into sighting of a group of 80 to 90 individuals on 18th August, 2014 at Kamlapur. At the beginning the team found only one nest. Later, a new nest was sighted on a Teak tree near a vulture restaurant. The positive development is that the villagers from other areas themselves have asked for vulture restaurants near their villages where they have reported the sighting of this valuable species. This shows that they are aware about vultures and the important role they play in maintaining the health of the ecosystem. In Mr. Atul's own words, "People's participation is vital for the long term survival of the vulture".

Training programmes were conducted for the frontline staff regarding vulture diversity, physiology and ecology by Mr. Atul Deokar. The department is planning for more awareness programmes. The research regarding the necessity of vulture restaurants is going on. The department wants to see whether the vultures

would still come without the fencing and machan. The department is thinking to conduct studies regarding the population, growth dynamics and sex ratio of the vultures. A Research centre for vultures is in the pipeline. A proposal for the same has been sent. Dhorph sites are conserved and villagers come forward for vulture conservation and encouraged through financial incentives and honoring them. Also, the Gidhad Mitras are providing an honorarium of Rs. 2000/- monthly monitoring the vultures and providing information to the department. At present three Gidhad Mitras work for the department. They provide regular updates of the sighting of the birds.

This unique success story shows importance of people's participation in conservation of endangered species and how much the support and contribution of the stakeholders matters. Mr. Atul Deokar and his team have proved that 'Actions speak louder than words'. When the so called conservationists are crying on top of their voices, here the dedication of a handful of 'greens in uniform' has actually made it possible with their undying dedication to the cause. The vulture was very near to the danger of local extinction in this area. The increase in the number of the individuals of this species is a matter of pride not only for the Kamlapur staff but also for the entire local community. And it would be possible for the coming generations to get a chance to see this amazing raptor in flesh and blood and not only read about it in books.

Unless India stands up to the world, No one will respect us. In this world, fear has no place only strength respects strengths.



Eco-sensitive zone for betterment of Protected Areas

Raghubansh Kumar Singh
RFO Trainee, 2014-15 Batch

Eco-sensitive zones are ecologically important areas, meant to create some kind of 'buffer zones' or 'transition zone' between areas of high protected such as national parks and sanctuaries under the Indian Wildlife Protection Act, 1972 to areas of lesser protection. ESZs are short-term conservation areas under section 3 (v) of the Environment Protection Act, 1986.

Objectives: The main objective is to impose restriction on the industries, operations, process and other developmental activities in the region which have detrimental effect on the environment, provide for restoration of denuded areas, management of catchment areas, watershed development etc., for a planned development. It is intended to ensure sustainable livelihood for local community and stakeholders.

Eco-sensitive zone would have to be site specific and relate to regular than prohibition, specific activities"

Honorable Supreme Court had ordered in 4th November 2006 that till states do not notify ESZs, projects within 10 km of a PA will require an approval from the National Board of Wildlife (NBWL). Under ESZ, commercial mining, logging industries and large hydro-power projects are prohibited as per the ministry guidelines. States might, therefore, be reluctant to notify ESZs and prefer NBWL clearances for projects near PAs.

Ministry of Environment and Forests' guidelines, issued in February 2011, say that a national level committee will identify ESZs within 10 km of the PAs boundary. The committee will consist of representatives from Wildlife Conservation Strategy (WCS) of the PAs boundary. The committee will comprise field staff of the forest, revenue and wildlife departments and an ecologist. The role of wildlife warden of the state, after

scrutinizing the committee proposals, will send them to the environment ministry.

Extend of Eco-sensitive zone: Many of existing Protected area have already undergone tremendous development in close vicinity to their boundaries. Some Protected area lying in urban area (eg. Panna Tiger Reserve, Madhya Pradesh, Guindy National Park, Tamil Nadu, Sanjay National Park, Maharashtra, Bandipur National Park, Karnataka etc.). Therefore the extent of eco-sensitive zone around Protected Areas will have to be flexible and Protected Area specific. The width Eco-sensitive zone and type of regulations will differ from Protected Area to Protected Area. In case of very fragile ecological patches and sensitive corridors connectivity, are even beyond 10 kms width.

Chief Wildlife Warden grouped the activities under the following categories.

(I) Prohibited

- Commercial Mining
- Setting of saw mills
- Setting of industries causing pollution
- Commercial use of firewood
- Establishment of major hydroelectric projects
- Use or production of hazardous substances
- Under taking activities related to tourism like over-flying the National Park area by any aircraft, hot-air balloons
- Discharge of effluents and solid waste in natural water bodies or terrestrial area

(II) Restricted with Safeguards

- Felling of tree
- Establishment of hotels and resorts
- Drastic change of agriculture systems
- Commercial use of natural resources

- including ground water harvesting
 - e. Erection of electrical cables
 - f. Fencing of premises of hotels and lodges
 - g. Use of polythene bags by shopkeepers
 - h. Widening of roads
 - i. Movement of vehicular traffic at night
 - j. Introduction of exotic species
 - k. Protection of hill slopes and river banks
 - l. Air and vehicular pollution
 - m. Sign boards and hoarding
- (III) Permissible**
- a. Ongoing agriculture and horticulture practices by local communities
 - b. Rain water harvesting
 - c. Organic farming
 - d. Use of renewable energy
 - e. Adoption of green technology for all activities

Conclusion: With the increasing pressure on land, ESZs are imperative to maintain the

integrity of our already fragmented PAs. There need to create eco-sensitive zones around national parks and wildlife sanctuaries to conserve wildlife, reduce man-animal conflict to improve socio-economic conditions of people living around eco-sensitive zones.

The monitoring committee in the ESZ is democratic. Only a handful of officials will take the decisions. People will be at their mercy every permission. Gram Sabha should be monitoring authority in ESZ. Most ESZ areas on revenue land. If people can't use their land according to their will, they will protest. The rights activists demand local participation incentives to the community for implementation. The Centre should come up with a plan to incentivise farmers for sticking to green practices in ESZs. ESZ are not meant to hamper their day activities, but instead, is meant to protect previous forest and PAs in their locality from negative impact and also to refine environment around the PAs.

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Silent Killers of Wildlife...

Vijaykumar Patil
RFO Trainee, 2014-15 Batch

responsibility of the human beings which is responsible???

Visitors coming to forest area bring food stuffs in bottles, plastics, polythene, wrappers and leave back all this plastic waste in the forest area directly or indirectly. This situation is not limited to forest



Source: Poster in Bandipur Tiger Reserve

Today, the whole world is worried about the existence and survival of wildlife on the Earth for ensuring their survival whole world is doing conservation of wild animals as most of our issue. Using highly developed modern science and technology for the wildlife management, establishing equipped anti-poaching camps inside the heart of forest to check the poaching of wild animals, using modern science for monitoring the population movement of animals, using high defined areas for surveillance, using more improved way to provide or produce food, water and shelter to wild animals and many more, but are there any lacunas which are still in hidden stage it not noticeable by the world regarding wildlife management?? The answer may be Yes it may be No or else you may not know??

During our South India tour while passing through one of the highway through Bandipur Tiger Reserve (BTR) of Karnataka I just looked around and to my surprise I saw empty mineral water bottles, plastics and wrappers used for packing of goods were spread over and around the road. Suddenly thoughts started cultivating my mind that if wild animals of BTR crossing the road during day or night time, then what will be the possibility or probability of this waste product which is created due to human activities being used as food by wild animals. And my thoughts got confirmed when I saw one poster to create awareness in BTR which was showing a deer eating wrapper used for packing potato chips. This awareness campaign through display of posters shows that park authorities are trying to their best to reduce this waste pollution in park area.

Then question arises, who should be held responsible for such nuisance? Is it the moral

area alone. The passengers of train purchase food and throw the wrappers either in train or simply just outside the train which gets accumulated along the railway track. In many big cities the dumping yard of city is situated on waste land which is near to marshy land, wetland, pond or lake. Due to this many plastic products starts accumulating there or gets further deposited in nallahs, river and then into sea.

In recent studies in cases of many of waterbirds, turtles, blue whales which were found dead large amounts of plastics have been recovered from their stomach. This plastic waste which has been eaten by wild animals obstructs their esophagus and blocks their digestive tract which silently starves the animal and finally results into its death. Besides this it decreases soil fertility as plastics are non-biodegradable and also has a dangerous effect on the environment as



burning of plastics or polythene releases many gases in the atmosphere. So this plastic pollution is one of the major concerns to be worried off in today's scenario.

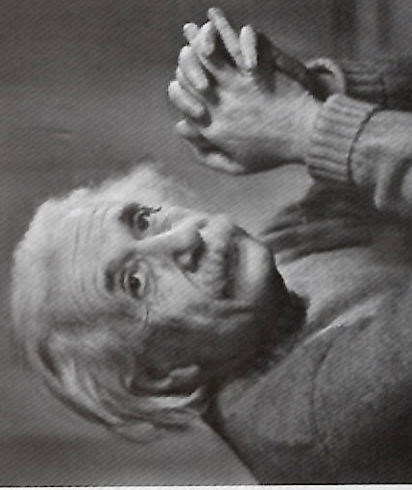
Considering the seriousness of the matter some of the authorities and individuals started working in forward direction like Mysore zoo authorities doesn't allow any wrapper inside zoo and instead they provide paper bags to visitors for carrying food stuffs inside zoo. They also take 10 Rs extra as deposit from visitors on purchase of any water bottle and return it after visitor submits the bottle at counter. This collected plastic and water bottles are later sent for recycling. Some countries banned manufacturing of plastic products. Even in India polythene bags of very small thickness are banned and also distribution of plastic bags in supermarkets for free is stopped and for plastic bag now customer has to pay extra money which will indirectly demotivate him from purchase of plastic bag and motivate him to go for reuse. Though these are small efforts but realizing the matter and taking initiation is first step towards achievement.

There are many ways through which we reduce the effects of this plastic pollution. First approach is to do the proper disposal of the plastic products and promoting the recycling reuse. Go for alternatives like papers biodegradable plastics, cotton bags which replace plastics products. Impose complete ban on some commonly used plastic items, such as bottled water plastic bags and wrapped goods. Increasing sensibility of visitors to forest area through public awareness effects of plastics on wild life through awareness rallies, campaigns, posters etc. It is also the responsibility of the government to give sanction and provide subsidies to support products which will reduce plastics from Earth. Also government should make and implement strong rules for plastic use.

Article 51-A of Indian Constitution says that every citizen of India shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife. Therefore, it is the moral responsibility of every individual to reduce, reuse and recycle such as silent killer of wildlife....

If you can't explain it simply, you don't understand it well enough.

- Albert Einstein



Sea Turtles and It's Importance.

Miss. Rohini Gadekar
RFO Trainee 2014-15 Batch



Sea turtles have played vital roles in maintaining the health of the World's oceans. Their roles range from maintaining productive coral reef ecosystem to transporting essential nutrients from the oceans to beaches and coastal areas. Major changes have occurred in the oceans because sea turtles have been virtually eliminated from many areas of globe. Commercial hunting loss of nesting habitat and climate change are among the human caused threats pushing sea turtles towards extinction. As sea turtle populations declines, so does their ability to fulfil all functions in ocean ecosystems. So their is need to conserve and protect sea turtles and build their populations to healthy levels.

During our tour we visited Andaman and Nicobar Islands located in the Bay of Bengal to the south east of the mainland of India and consist of 345 Islands with a coastline stretch of 1962 km. Four species of sea turtles occur in the Andaman and Nicobar Islands; the leatherback, hawksbill, green and olive ridley turtle. Historically sea turtles in the Andaman and Nicobar Islands have always been mentioned in association with the indigenous people of the islands, since turtles were an important food source for the original inhabitants. The ban on hunting and harvesting of turtles come in force in 1977, sea turtles are protected under schedule 1 of the Indian Wildlife (Protection) Act (1972).

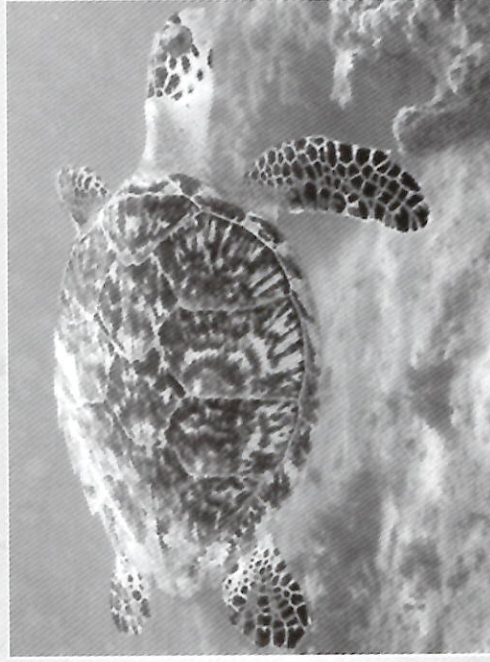
Importance of sea turtles Ocean Ecosystems:
The leatherback turtle (*Dermochelys*)

Leatherback, the largest of the sea turtles, feeds the farthest of any sea turtle species and has wide ranging effects on the ocean ecosystem. Leatherback get their energy and nutritional needs from a small, gelatinous source

- jellyfish. Leatherback plays pivotal ecological role as top predator. Population of jellyfish increases. Which could further shift species dominance from fish to jellyfish.

2. The Hawksbill turtle (*Eretmochelys imbricata*)

The Hawksbill turtle equipped with beak-like mouths, forage on Variety of marine sponges. By doing this, they can change the



species composition and distribution of sponges from reefs, hawksbill allow other species, such as coral, to colonize and grow. Without Hawksbills, sponges are likely to dominate reef communities.

further limiting the growth of corals and modifying the very structure of coral reef ecosystems. The physical and chemical defences of sponges prevent most fish and marine mammals from eating them. As hawksbill rip sponges apart during feeding, they expose food to marine species typically unable to penetrate the sponge's exterior, making sponges more vulnerable to predators. Through their selective foraging behaviour, hawksbill impact the overall diversity of reef communities.

3. The Green Sea turtle (*Chelonia mydas*):

Green sea turtles, one of the few large species of herbivores that eat sea grass, help to maintain healthy sea grass beds. When Green sea turtle graze, they increase the productivity and nutrient content of sea grass blades. Without constant grazing, Sea grass beds become overgrown and obstruct currents, shade the bottoms, begin to decompose and provide suitable habitat for the growth of slime molds. Older portions of sea grass beds tend to be overgrown with microorganisms, algae, invertebrates and fungi.

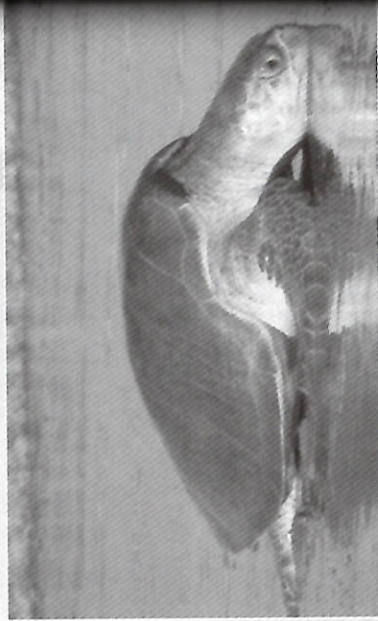
Sea turtle forages on sea grass just a few centimetres from the bottom of the blades, allowing older, upper portions of the blades to float away. As the turtle crop and re-crop the same plot, sea grass blades are removed from the



area rather than accumulating on the bottom. This results in a 15 fold decrease in the supply of nitrogen to sea grass roots, which impacts plant species, nutrient cycling, animal densities and predator-prey relations.

4. Olive ridley turtle (*Lepidochelys olivacea*):

The olive ridley is omnivorous meaning it feeds on crabs and shrimps, algae, jellyfish, snails, invertebrates, fish eggs. Capable of foraging at 110 m depth. Plays important role in both oceanic and coastal ecosystems (nesting at beaches). When female lay eggs four possibilities are there each with its own energy path. a. The egg hatch and most of the nutrients return to the sea



hatchlings, leaving some nutrients on the beach in the form of eggshells and embryonic fluid; b. eggs fail to hatch, allowing nutrients to enter detrital food chain; c. The eggs are consumed by predators; d. The eggs penetrated by root enabling plants to absorb the nutrients. In addition, nesting and the emergence hatchlings bring matter and nest organisms on nesting beaches.

5. Other importance :

- Sea turtle improves nesting beaches- When female lay their eggs on sandy shorelines they introduce nutrients and energy from distant and dispersed foraging grounds into relatively small and nutrient poor beaches.
- Many marine organisms rely on sea turtles as a place to call home. These small creatures called "epibionts" attach themselves to solid surfaces in the ocean such as floating debris and sea turtle shells. Helps in wider dispersal of "Epibionts"
- Benefits the ocean floor ecosystems- turtles by breaking up the shells which foraging increases the rate of the shells

disintegrate and increase the rate of nutrient recycling in ocean bottom ecosystems.

Management strategies of forest department:

Sand mining - Many nesting beaches destroyed due to sand mining.

Depredation of eggs, hatchlings and turtles by feral dogs is also a major concern at the several beaches.

Tourism related activities, which is mainly affects the green sea turtle and olive ridley turtles, are posing to be a mounting threat.

Incidental catch and consumption of meat and eggs by indigenous tribes.

Management strategies of forest department:

Conservation of marine turtles has been aided by the 1978 notification which declared 94 Islands of Andamans as sanctuaries which included 30 islands that were confirmed marine turtle nesting sites. The forest department has laid out management plans with accompanying guidelines, and protection forces are posted in some critical areas. Regular monitoring and patrolling is done in nesting areas.

With best wishes

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Corals of Andaman and Nicobar Islands

Monal Kataria
RFO Trainee, 2014-15

The Noun '**CORALS**' is believed to have derive its origin from an Arabic word '**gorals**' means pebble. The present English version means hard stony skeleton secreted by certain marine *polyps*.

Corals are sessile marine invertebrates in class *Anthozoa* of phylum *Cnidaria*. When coral colonies grow continuously in size by budding or dividing of polyps, the result is the formation of extensively masses of various corals, known as '**Coral Reefs**'. Hard corals have an outer skeleton made of limestone, also known as calcium carbonate, and soft corals have tiny bits of calcium carbonate embedded inside their bodies.

CORAL GROUPS FOUND IN ANDAMAN AND NICOBAR

There are 250 coral species reported from these islands, some important Coral groups are as follows

Acropora, *Porites*, *Montipora*, *Paciliopora*, *Millepora*, *Helliopora*, *Goniopora*, *Favia* etc.

Different structural types of coral reefs are distinguished:

- (i) Fringing reefs;
- (ii) Patch reefs;
- (iii) Barrier reefs; and
- (iv) Atolls.

Fringing reefs: develop adjacent to the shore usually along rocky coasts of uplifted islands or along the shores of exposed limestone islands.

Patch reefs: isolated and discontinuous patches of fringing reefs.

Barrier reefs: develop sometimes rather far away from coastlines in areas where coral growth has kept up with gradual drop of the sea-bed.

Atolls : circular reefs that arise from deep sea platforms such as submerged volcanic seamounts.

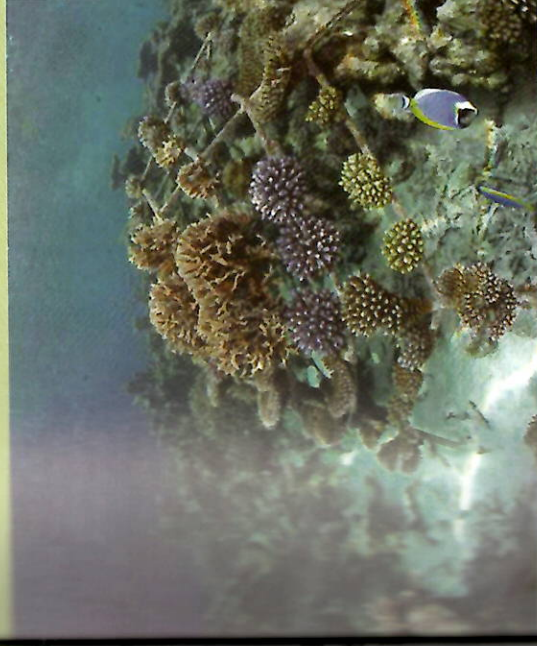
OCEAN ACIDIFICATION

Increased carbon dioxide level increases the pH of the water which leads to Ocean acidification. This is a process in which corals cannot absorb calcium carbonate from the water to build their calcium carbonate and stony skeleton of coral reefs will be dissolved.

CONSERVATION OF CORAL REEFS

The coral reefs of Andaman and Nicobar Islands are the biodiversity hot spot of India. The high rate of population in these islands at alarming rate will lead to resource depletion and coral reef degradation. There is an urgent need for evolving effective management to protect the coral reefs. For this, the following research activities are needed.

Environment monitoring site should be established



Study each reef to study the patterns of recovery and changes in reef structure.

Mapping of coral reef resources using remote sensing and GIS techniques.

Study the physiological status of coral reefs using molecular biomarker system.

Nowadays corals are affected by different kind of diseases. Intensive research is needed in this respect.

Coral reefs are highly susceptible to pollution. Chemical stresses and eutrophication yet to be studied.



Monitoring the fish stock assessment on each reef. Biological productivity of our reefs not been assessed properly. Regional differences on productivity should be deliberated.

Long term water quality monitoring programme should be initiated. Due to the inadequate data, we don't know what is happening to our reefs.

Studies on natural damages i.e. crown of thorn star fish outbreaks, Earthquake & *Tsunami*, Rates of bioerosion on coral reefs should be initiated.

Reef tourism is increasing at high rate. Mooring Buoy programme should be initiated to minimize the coral damage.

Biodiversity studies on coral reefs. Available information is restricted on certain reefs or shallow depths.

Coral growth studies- modest information is available. Assessment of socio-economic impacts on reefs.

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Evergreen Casfos

Different shades of the

Four

Aranyam



Counting growth rings..... tips from expert



Advance technologies in Forestry.....



Excuse me.....



Felicitation



How sandal is a partial root parasite...?



Women's Empowerment



Aranyam



Felling and logging exercise



From ground level experts.....



Learning by doing.....



Tiger pug mark.....



Trekking during Working plan tour



Listening carefully.....



Respecting culture.....



Finding shadow in the desert....



Aranyam



R.F.O. Trainees (2014-15) Batch with Managing Director of FDCM during Central India Tour



R.F.O. Trainees (2015-16) Batch at Botanical Garden, Kolkata

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Human-Animal Conflict: Causes and Solution

Kishor Kumar Nautiyal
R.F.O. Trainee 2015-16 Batch

These lines were said by Nasir Kazmi, planning the story of diminished forests, and to the pain of home habitat destruction of wild animals. Degraded forests results in man-land conflict and struggle between them. fact it is the struggle of area expansion.

If we look back, the incidence of man-land conflict has increased over the years, specially in those areas around the forests. for the creation of the new state, Uttarakhnad, it till mid 2010, death of more than 300 people wild animals has been recorded. Tigers, rhinots, panther and wild boars are the animals which are mostly involved in these

reason behind **man-animal conflict-**

With the increase in population, people started concentrating more on agriculture and cutting down forests for the cultivation of crops. This ultimately changes the forests to agricultural lands. This is one of the main reasons for man-animal conflict.

Human interference and excessive needs are not only forest degradation but also advance in the life style of wild animals. uncontrolled and hazardous development

electricity generation, etc. which has contributed to the degradation of forest and it destroy the habitat of wild animals. Other reasons includes hotel and resorts construction near the National Park and wild life areas leading to imbalance in biodiversity.

MEASURES: -

- ◆ Upgradation of forest land.
- ◆ Illicit felling must be stopped.
- ◆ Sustainable development must be encouraged.
- ◆ Ecotourism must not be done at the cost of environmental loss and habitat destruction of wild animals.
- ◆ Controlled mining should be done.
- ◆ Construction of wall around the crop field.
- ◆ Maintain proper law and order.

CONCLUSION:

Wild life conservation is very important. It is necessary for maintaining environmental balance and biodiversity conservation. So, being the most intelligent animal, we must take care of the other animals and focus to conserve them instead of destroying their habitat. Otherwise there would be no end of this conflict.



Some facts on "Feathers"

(epidermal growth forming the distinctive outer covering on birds)

Amit Kumar Gwasikoti
RFO Trainee, 2015-16 Batch

- **Plumology** (plumage science) is the name for the science that is associated with the study of feathers.
- Although feathers cover most part of the body of the bird, they arise only from certain well define tracts on the skin. They aid in flight, thermal insulation, water proofing and coloration that helps in communication and protection.
- Birds shed their feathers at intervals and grow new ones. This process is called **moulting**. Feathers fall in a set pattern and in pairs, one from each side, so that the birds flight is not unbalanced. Birds that do not fly, such as penguins, moult all over.
- A song bird such as a sparrow has about 3000 feathers in the summer but as many as 3500 in the winter to keep it warm. A chicken has about 9000 feathers and the swan may have 25216. The bird with the fewest feather is the **RUBY THROATED HUMMING BIRD** with only 940.
- Native American Indians used feathers from **hawks** and other birds of prey in their head dresses. They believe that they would gain the birds strength and powerful eyesight.
- Traditionally a white feather was a sign of cowardice. This may have come from the old sport of cock fighting-inferior birds were often cross breed with a white feather in their tails.
- **Grebes** eat their own feather. They are thought to form pellets that help the bird bring up the bones and scales of the fish they eat.
- The Japanese **phoenix fowl** is a domestic bird. It is bred with tail feathers measuring up to 10.6 meter, the longest of any bird.
- Pens for writing were once made from quills or feathers of geese, turkeys and other birds. The word pen comes from the Latin *penna*, a feather. Quills were sharpened with penknife and dip in ink.
- Each feather weighs very little, but together they make up a large part of the weight of a bird, especially as flying birds have very light skeletons. The skeleton of the frigate bird is large bird with a 2.1 meter wingspan, weighs just 113 gram, less than the weight of all its feathers.
- Bird feathers have long been used for fletching arrows.
- Feathers are both soft and excellent at trapping heat, thus they are sometimes used in high-class bedding, especially pillows, blankets, mattresses.
- Feather waste has been used in a number of industrial application as a medium for culturing microbes, bio-degradable polymers and production of enzymes.

Amit Kumar Gwasikoti, RFO trainee (2015-16) batch

Source: 1-development and evolutionary origin of feathers (Journal of experimental zoology) 1999.

Let us sacrifice our today so that our children can have a better tomorrow.



LET'S PAINT THE WORLD GREEN

Soniya Kumari
RFO Trainee, 2015-16 Batch

We all know that forests are the lungs of our planet and the survival of our planet depends on forests. Besides this, forest also provides a wide range of economic and social benefits to mankind, including growth and development of overall economy of the nation. Maintaining and enhancing these functions is an integral part of sustainable forest management. This is where the task of painting the world green lies.

The timber and NTFPs, being the contributing elements in terms of economic growth, forest benefits the social and economic well-being of the forest dependent people. Forest is the most important component for the survival of every living being as it controls pollution and regulates the climate. However,

deforestation, particularly in the tropical rain forests has become a major environmental concern. Deforestation has led to the destabilization of the earth's temperature, humidity and carbon dioxide levels.

Efforts to control deforestation at global and national levels including those at the 1992 UN conference on environment and development remained ineffective. Why? Because, besides these efforts, it is the responsibility of every individual to take a step toward this goal. We should individually contribute towards planting more trees to make our world greener and inspire others to do the same.

TEN TIPS FOR SUCCESS

1. Be optimistic & open minded.
2. Be a good listener and improve your communication skills.
3. Improve your memory, make effort to remember name and details about people.
4. Use the magic words "please" and "thank you" as often you can.
5. Apologize when you are wrong.
6. Look upon problems as opportunities.
7. Never underestimate the competition.
8. Don't dwell on your past, instead learn from it and move on.
9. Carefully manage your time. It's the scarcest resource.
10. Smile it relieves the personae.

Sanchita Verma
R.F.O. Trainee 2015-16 Batch



Discipline-The key of Success

Lalit Kumar
RFO Trainee, 2015-16 Batch



The key to your success is within one's grasp, and all that one needs are the right tools and the right mindset. This is covered by discipline. Discipline gives us an opportunity to learn, experience and grow. Without discipline there will be complete disorder and failure in every task or step. There will be no peace and progress without discipline.

Discipline is a solid concept which can be applied in all walks of life. It is to be guided by rules. Discipline is valued everywhere and every time. In schools if the students are not disciplined, they will learn nothing and very much the purpose of education will be defeated. Similarly, if a subordinate does not obey senior officers in offices and work places or factories, it will be difficult to carry on the work of administration and production.

An army cannot win a battle if the soldiers do not obey the order of their commanders. A disciplined army is a great source of strength to the country. The country will not succeed if the public servants lack discipline. A nation can't rise if the people do not know the value of discipline. Without discipline a man can never shine and succeed in life. Discipline is very necessary in a person's life.

Discipline is like a container of success. It is the best thing where there is no evil in it. It builds character, develops strength and unity and fosters co-operations. It is therefore necessary that everyone should be taught discipline from their very childhood. It should be never overlooked as it is the secret of success in life.

Nowadays, crimes and thefts are on the rise. People seem to have forgotten the value of discipline. In India overcrowding in buses and trains is very common. Travelling without tickets in trains is a normal feature. Student indiscipline is the talk of the town. These examples are sufficient to understand that the indiscipline is the root cause of these problems. Only discipline can sort out these problems. So it is the right time to bring awareness amongst all about discipline. It is the need of the hour.

If a person wants to live a successful life, he/she must be disciplined. The higher the sense of the discipline, the better it is for the people and the country.

हिन्दी विभाग



जलवायु परिवर्तन: एक अनसुलझा सवाल

Sadhu Lal & Uday Nand G
RFO Trainee, 2015-16 B

वर्तमान समय में वैश्विक स्तर की दो बड़ी मुख्य चुनौतियाँ हैं। आतंकवाद व जलवायु परिवर्तन। जलवायु परिवर्तन मानव विकास व मानव अस्तित्व के लिए गंभीर खतरा है। जलवायु परिवर्तन वैश्विक पर्यावरण में लगातार बढ़ते हुए प्रदूषण का परिणाम है। बढ़ती जनसंख्या औद्योगीकरण, अनियंत्रित नगरीकरण व वाहनों की बढ़ती संख्या व नोनूलन आदि कारणों से प्रदूषण खतरनाक स्तर तक पहुँच गया है, परिणामस्वरूप प्राकृतिक संसाधनों, भूमि, जल, वायु के साथ-साथ पारिस्थितिकी संतुलन भी असंतुलित हो गया है पर्यावरण में ऐसी गैसों की मात्रा बढ़ गयी जिससे पृथ्वी के औसत तापमान में वृद्धि हो गयी, मुख्यतः ये गैसें- कार्बन डाई आक्साइड सल्फर डाई आक्साइड मैथेन आदि हैं। इन गैसों ने पृथ्वी के बाहर एक स्तर बना दिया है जो सूर्य की उर्जा को अवशोषित करके पृथ्वी के तापमान को बढ़ा देती है इस प्रक्रिया को ग्रीन हाउस प्रभाव कहते हैं तथा इन गैसों को ग्रीन हाउस गैसें कहते हैं।

जलवायु परिवर्तन ताप वृद्धि का परिणाम है जिस कारण जलवायु चक्र परिवर्तित, अनियंत्रित व अनियमित हो जाता है, जिस कारण सूखा, अतिवृष्टि, ग्लेशियर पिघलना, बाढ़, चकवात आदि जलवायुवीय समस्याएँ उत्पन्न होती हैं, कृषि उत्पादन भी वर्षा के अनियमित होने के कारण प्रभावित होता है व घातक बीमारियों को जन्म देती है जो मानव व कृषि के लिए खतरनाक है।

तापमान वृद्धि से ध्रुवों पर जमी बर्फ पिघल जायेगी, जीवनदायिनी पहाड़ी, सरितायें व नदियाँ। जिनका उद्गमस्रोत ग्लेशियर है उनका अस्तित्व पर भी प्रश्नचिन्ह लग जायेगा, नदी घाटियों की सम्यताओं के नश्ट होने का खतरा पैदा हो जायेगा, एक तरफ सूखा तो दूसरी ओर बाढ़ की स्थिति पैदा होगी, फलतः समुद्र जलस्तर में वृद्धि हो जायेगी जिससे समुद्र किनारे बसे शहर जलमग्न हो जायेंगे, जिससे अपार जन धन की हानि होगी। विश्व की 65 प्रतिशत आर्थिकी समुद्र किनारे बसे शहरों में उत्पादित होती है, गरीब देशों व गरीब लोगों पर जलवायुपरिवर्तन की

वर्ष 1999 में युएन की महासभा ने सभी देशों की सहमति से शीत को प्रतिष्ठ किया जिसे "यूनाइटेड नेशंस फ्रेमवर्क ऑन क्लाइमेट चेंज" "यूनाइटेड नेशंस फ्रेमवर्क ऑन क्लाइमेट चेंज" के नाम से प्रस्तावित किया गया है। जिसमें मुख्य बिंदु निम्न हैं-

जलवायु परिवर्तन एक गंभीर वैश्विक समस्या है, तापमान बढ़ोतरी को तत्काल रोकना होगा इसके लिए 1990 की तुलना में वैश्विक तापमान में वृद्धि में 2 डिग्री सेल्सियस से कम करने का लक्ष्य रखा गया तापमान रोकने के लिए ग्लोबल वार्मिंग गैसों के उत्सर्जन पर रोक लगाना परमावश्यक है।

इस तबत प्राप्ति के लिए प्रतिवर्ष यूएन द्वारा सभी देशों का समन्वय बुलाया जायेगा, व कार्बन उत्सर्जन पर रोक लगाने पर विचार किया जायेगा इन कॉन्फ्रेंस को "कार्बन ऑन पार्टीज" अथवा "सीओपी" के नाम से जाना जाता है इसी के अन्तर्गत अभी तक 20 सम्मेलन हो चुके हैं, बीसवाँ सम्मेलन पेरू की राजधानी लीमा में दिसंबर 2014 को आयोजित किया गया विकसित व विकासशील देशों के मध्य मतभेदों को दूर करने के लिए कोई वाध्यकारी कार्यक्रम पर सहमति नहीं बन पायी है।

जलवायु परिवर्तन समस्या समाधान की जिम्मेदारी सभी देशों की ही होगी, कार्बन कटौती में योगदान बढ़ाने के अर्थ पर होगा अर्थात् "देश की क्षमता के अनुसार" समस्या लेकिन जिम्मेदारी" के सिद्धांत ही अपनाया गया है।

सम्मेलन 1992 का अर्थ है कि जलवायु परिवर्तन वातावरण को सुरक्षित रखा जायेगा, 1992 में स्टोकहोम सम्मेलन में प्रस्तावित किया जाता है, 1992 में स्टोकहोम सम्मेलन में प्रस्तावित किया गया, जिसमें 150 देशों की सहमति से "यूनाइटेड नेशंस फ्रेमवर्क ऑन क्लाइमेट चेंज" के नाम से भी जाना जाता है, इसमें सतत विकास के लिए एजेंडा 21 स्वीकृत किया गया व निम्न बिंदुओं का प्रावधान किया गया-

पृथ्वीवर्ती वायुमंडल के स्वास्थ्य व अखण्डता को सुरक्षित रखित व पुनः स्थापित करने के लिए विकसित देशों को प्रोत्साहित करेंगे।

देशों को प्रभावी पर्यावरण कानून लागू करने चाहिए। एक देश दूसरे देश को प्राकृतिक दुर्घटनाओं की सुरक्षा



सूचना व सहयोग देगा।

- सतत विकास व जीवन की उच्च गुणवत्ता की प्राप्ति के लिए सरकारों को उत्पादन व उपभोग में सामंजस्य बनाना चाहिए।

क्योटो प्रोटोकॉल 1997 में इसी क्रम में जापान के शहर क्योटो में जलवायु परिवर्तन सम्मेलन का आयोजन किया गया जिसे "क्योटो प्रोटोकॉल" भी कहा जाता है, इसमें प्रावधान किया गया कि 37 विकसित देश सामूहिक रूप से ग्रीन हाउस गैस उत्सर्जन को 1990 के स्तर पर लाने के लिए 2008 से 2012 तक 5.2 प्रतिशत कार्बन कटौती करें।

2001 में अमेरिका ने इसे अस्वीकार कर दिया जबकि अमेरिका ग्रीन हाउस गैस का 24 प्रतिशत वैश्विक उत्सर्जन करता है। 2004 तक 55 देशों ने इस पर हस्ताक्षर कर दिये थे।

बाली सम्मेलन 2002

2007 में इंडोनेशिया के शहर बाली में विकसित देशों द्वारा विकासशील देशों को जलवायु परिवर्तन की समस्या के समाधान के लिए आर्थिक व तकनीकी संसाधन उपलब्ध करने पर सहमति बनी, लेकिन क्रियान्वयन का अभाव रहा।

कोपेनहेगन वार्ता 2009

2009 में डेनमार्क की राजधानी कोपेनहेगन में "कॉप" का आयोजन किया गया जिसमें जलवायु परिवर्तन चुनौतियों का सामना करने के लिए "ग्रीन क्लाइमेट फंड" की स्थापना का निर्णय लिया गया, जिसमें विकसित देशों द्वारा प्रतिवर्ष 100 बिलियन डॉलर की राशि देने का निर्णय लिया गया, लेकिन इसमें कोई विशेष योगदान नहीं दिया गया। 2014 तक इसमें मात्र 10 बिलियन डॉलर की ही राशि एकत्रित हो पायी।

जलवायु परिवर्तन वार्ताओं की सफलता में मुख्य बाधा विकासशील व विकसित देशों में मध्य सहमति का न बनना है विकासशील देशों का तर्क है कि पर्यावरण विघटन के लिए विकसित देश जिम्मेदार हैं। अतः विकसित देशों की जिम्मेदारी पर्यावरण संरक्षण प्राथमिकता होनी चाहिए, व योगदान देना चाहिए, जबकि विकसित देश चाहते हैं कि सभी देशों की समान जिम्मेदारी होनी चाहिए।

बीसवाँ जलवायु परिवर्तन सम्मेलन दिसंबर 2014- लीमा सम्मेलन

1 से 12 दिसंबर 2014 को पेरू की राजधानी लीमा में "कॉप 20" का बीसवाँ जलवायु परिवर्तन सम्मेलन आयोजित

किया गया। इस सम्मेलन में 196 देशों के राजनेताओं व प्रतिनिधियों ने भाग लिया। भारतीय प्रतिनिधिमंडल का नेतृत्व पर्यावरण व जलवायु परिवर्तन मंत्री प्रकाश जावड़ेकर द्वारा किया गया। भारत ने विकासशील देशों के पक्ष में मजबूती से तर्क रखा व टोक्समूह का भी निर्माण किया। जिसमें ब्राजील, दक्षिण अफ्रीका, व चीन शामिल है। विकासशील देशों ने तर्क दिया कि जलवायु संकट पैदा करने के लिए विकसित देशों की भूमिका है, अतः उन्हें पर्यावरण संरक्षण की नैतिक व ऐतिहासिक जिम्मेदारी लेनी चाहिए व विकासशील देशों को तकनीकी व आर्थिक सहायता प्रदान करे। वहीं विकसित देश भारत व चीन जैसी उभरती हुई आर्थिक शक्तियों को विकासशील श्रेणी में नहीं मानते व तर्क देते हैं कि सभी देशों को बराबर योगदान देना चाहिए भारत व अन्य विकासशील देश कार्बन कटौती की बाध्यकारी सीमा से मानने से इंकार करते हैं क्योंकि उनका भी विकास प्रभावित होगा।

वार्ताओं को असफलता के कगार से बचाने के लिए दोनों पक्षों द्वारा बीच का रास्ता अपनाया गया व "लीमा कॉल फॉर क्लाइमेट एक्शन" नामक दस्तावेज तैयार किया गया जिसमें निम्न बातें हैं—

- आगामी पेरिस सम्मेलन मार्च 2015 तक प्रत्येक देश कार्बन उत्सर्जन में कटौती करने के अपने स्वैच्छिक उद्देश्य प्रस्तुत करे।
- भारत व विकासशील देशों की मांग पर "देशों की

क्षमता के अनुसार सामान्य लेकिन जिम्मेदारी" के सिद्धान्त हो शामिल किया गया।

- मिटिगेशन व एडॉप्शन पर भी सहमति बन पायी। अन्ततः यह कहा जा सकता है कि 1990 के दशक शुरू हुए यूएन के कॉप, 2014 तक किसी ठोस निर्णय तक पहुंच पाए यह बिडंबना ही है कि ऐसे जीवन अस्तित्व मुद्दों पर अभी तक वैश्विक समुदाय की सहमति नहीं पायी। लीमा सम्मेलन मुख्यतः मिटिगेशन, एडॉप्शन, संसाधनों की व्यवस्था व कार्बन रहित विकास के उपयुक्त तकनीकी व विकासशील देशों को हस्तान्तरण सिमटा रहा। हमें आशावादी दृष्टि से देखना चाहिए कि 2015 में होने वाले पेरिस जलवायु परिवर्तन सम्मेलन बाध्यकारी मानकों पर सहमति बनें।

वहीं भारत व चीन उभरती अर्थव्यवस्था वाले इनको अपनी जिम्मेदारी को वैश्विक हितमें निर्धारित चाहिए, वर्तमान में चीन विश्व में सबसे बड़ा कार्बन उत्सर्जक देश है, अमेरिका कार्बन उत्सर्जन में दुनिया में दूसरे स्थान पर है। अमेरिका व अन्य विकसित देशों की राय अन्य विकासशील देशों को छोड़ भी दिया जाये तो भारत को समान भागीदारी उठानी चाहिए। विश्व विराट् भारत पर कार्बन कटौती का दबाव है। समय पर भारत अपने कार्बन कटौती के उद्देश्यों को निर्धारित करना व विश्व में एक मिशाल कायम करनी चाहिए ताकि भारत में आदर्श स्थान पर बना रहे।

If you are still searching for that one person who will change your life, look in the mirror.



उत्तराखंड का पर्यावरण संरक्षण में योगदान

Sanchita Verma
RFO Trainee, 2015-16 Batch

रक्षासूत्र आन्दोलन

उंचाईपर वृक्ष कटान को हटाने के विरोध में वृक्ष पर रक्षासूत्र बांध कर उसकी रक्षा संकल्प लेने संबंधी यह आन्दोलन 1994 में टिहरी जिले के भिलंगना क्षेत्र से श्री सुरेशभाई ने शुरू किया।

मैती आन्दोलन

मैती शब्द का अर्थ पहाड़ में "मायका" होता है। इस अनोखे आन्दोलन की शुरुआत श्री कल्याणसिंह रावतजी के द्वारा सन् 1995 में चमोली जिले के ग्वालदमनामक स्थान से हुई, इस आन्दोलन के तहत विवाह समारोह के दौरान वर-वधू द्वारा पौधा रोपने और इसके बाद मायके पक्ष के लोगों द्वारा उसकी देखभाल करने की परंपरा विकसित हो चुकी है।

सरकारी प्रयास

पारिस्थितिकी, विज्ञान एवं पर्यावरण संबंधी अन्य मामलों में अनुसंधान को प्रोत्साहित देने तथा शिक्षा जागरूकता एवं प्रशिक्षण की सुविधायें प्रदान करने के उद्देश्य तथा वन्य जीव प्रबंधन के साथ-साथ जनमानस की आकांक्षाओं एवं अभिरूचियों को जोड़ने के उद्देश्य से सरकार के द्वारा समय-समय पर विभिन्न कार्य क्रम तथा योजनाओं को क्रियान्वयन किया जा रहा है जिनमें से कुछ अग्रलिखित है—

- राज्य में वनों के विकास तथा पर्यावरण संरक्षण के क्षेत्र में कई योजनाओं तथा कार्यक्रम क्रियान्वित किये जा रहे हैं जैसे जगत सिंह जंगली द्वारा मिश्रितवन खेती मॉडल, अपना गांव अपना वन, नागरिक एवं वन सोय मवन विकास योजना।
- प्रदेश के रिक्त एवं बंजरस्थानों में वनरोपण कर के वन क्षेत्रफल में वृद्धि के लिए विभिन्न प्रयास किये जा रहे हैं तथा साथ ही साथ सामाजिक तथा कृषि वानिकी को प्रोत्साहित करने हेतु कदम बढाये गये हैं।
- राज्य में पारिस्थितिकीय पर्यटन को लोकप्रिय बनाने हेतु जैवविविधता वाले क्षेत्रों का संरक्षण एवं संवर्धन किया जा रहा है।
- देश में पहली बार उत्तराखंड पौधरोपण नीति लागू की गयी व 25 जुलाई को श्री श्रीदेवसुमन के

पुष्प विभाग तथा गंगा के मैदान के बीच स्थित उत्तराखण्ड राज्य सदैव ही पर्यावरण संरक्षण के क्षेत्र में अग्रणी रहा है। पहाड़ों, घाटियों, जंगलों तथा नदियों से युक्त इस विविधता को यह क्षेत्र आदि काल से ही अपने प्राकृतिक सौंदर्य तथा जन्तु प्रजातियों को आवास प्रदान कर रहा है।

पर्यावरण नीति - जन्तुओं तथा सूक्ष्म जीवों की रक्षा एवं एकता को बनाये रखने के उद्देश्य से उत्तराखण्ड राज्य में पर्यावरण संरक्षण के क्षेत्र में अनेक प्रयास किये गये हैं। इनमें से कुछ प्रयास सरकारी तथा अन्य सरकारी अथवा संस्थाओं द्वारा किये गये हैं।

उत्तराखण्ड पहाड़ी राज्य होने के नाते यहां के जंगल व जमीन पर प्राचीन काल से लगातार पर्यावरण संरक्षण के लिए हमेशा प्रयासरत रहे हैं। वनों की रक्षा और पर्यावरण संरक्षण के लिए हमेशा प्रयासरत रहे हैं। वनों की रक्षा और पर्यावरण संरक्षण के लिए हमेशा प्रयासरत रहे हैं। वनों की रक्षा और पर्यावरण संरक्षण के लिए हमेशा प्रयासरत रहे हैं।

इस आन्दोलन की शुरुआत 1972 में, वनों की रक्षा और पर्यावरण संरक्षण के लिए हमेशा प्रयासरत रहे हैं। वनों की रक्षा और पर्यावरण संरक्षण के लिए हमेशा प्रयासरत रहे हैं। वनों की रक्षा और पर्यावरण संरक्षण के लिए हमेशा प्रयासरत रहे हैं।

इस आन्दोलन को प्रशिक्षित दिलाने का श्रेय श्री सुन्दरलाल शर्मा को जाता है इस हेतु "हिमालय बचाओ देश बचाओ" नाम की बहुगुणा ने दिया।

श्री गंगी आन्दोलन

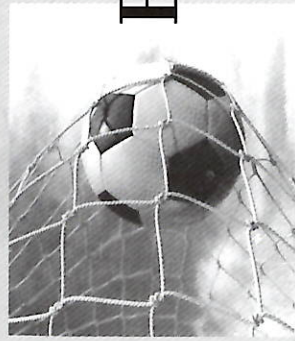
इस आन्दोलन के सूत्रधार एक शिक्षक स्वामीजी ने दूधौली लोक विकास संस्थान के माध्यम से इस क्षेत्र में जन जागरण और सरकारी अधिकारियों पर दबाव बना कर वनों की अंधाधुंध कटाई को रोकने का प्रयास किया। इस आन्दोलन के तहत बच्चों, नौजवानों, महिलाओं ने 16 लाख से भी अधिक पेड़ लगाये हैं।

- पुण्यतिथि में वृक्षारोपण दिवस में मनाया जाता है।
- वन्य जीवों के संरक्षण हेतु उत्तराखण्ड में 6 नेशनल पार्क, 6 वन्य जीव विहार, 2 संरक्षण आरक्षित, एक उच्चस्थलीय प्राणी उद्यान तथा एक जैव सुरक्षित क्षेत्र है।
 - 1980-81 की कस्तूरी मृग फार्म योजना के तहत 1982 में चमोली के कांचुलाखर्क में एक कस्तूरी मृग प्रजनन एवं संरक्षण केन्द्र की स्थापना की गयी है।
 - सन 1991-92 में टाईगर और हिम तेंदुआ के संरक्षण के क्षेत्र में कदम उठाते हुए 'टाईगर वॉच' तथा 'स्नोलेपर्ड योजना' प्रारंभ की गयी।
 - राज्य में वन्य क्षेत्रों का चयन, वन्य जीव सुरक्षा एवं संरक्षण की नीति का निर्धारण करने हेतु मुख्यमंत्री

की पदेन अध्यक्षता वाले राज्य वन्यजीव बोर्ड का किया गया।

- 1973 में टाईगर प्रोजेक्ट की शुरुआत के नेशनल पार्क नैनीताल से की गयी।
- पर्यावरणीय दृष्टि से उत्तराखण्ड एक राज्य है प्राचीन काल से ही यहां के लोगों ने जंगल, जमीन की रक्षा अपने प्राणों की कीमती की, वन आधारित जीवन शैली होने के महिलाओं का योगदान सराहनीय रहा उत्तराखण्ड की महिलाएं विश्व में पर्यावरण संरक्षण की प्रेरणा स्रोत रही है। स्व. गौरादेवी ने चिन्मोहन को सफल बनाया व दुनिया के सामने नवीन विचार प्रस्तुत किया।

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उत्तराखण्ड : एक प्राकृतिक एवं सांस्कृतिक विरासत

Mrs. Mamta Chand
FRO Trainee, 2015-16 Batch

संस्कृति

यहां अनेक त्योहार मनाये जाते हैं। पूरे विश्व में मेले और त्योहार सामाजिक गतिविधियों का महत्वपूर्ण अंग है। उत्सव सांस्कृतिक परम्पराओं के कारण अलग-अलग ढंग से मनाये जाते हैं।

जनपद पिथौरागढ़ में भाद्रपद माह में गौर महेश्वर पर्व के आठवें दिन बाद प्रतिवर्ष हिल जात्रा का आयोजन होता है। यह पर्व मुखौटा नृत्य-नाटिका के रूप में मनाया जाता है। इसका मुख्य पात्र लखिया भूत, महादेव शिव का मुख्य गण वीरभद्र माना जाता है। यह उत्सव कृषि से सम्बन्धित है। साथही खुशहाली का प्रतीक है। इसमें कृषि से सम्बन्धित किराएँ नाटकीय रूप में दिखायी जाती हैं।

बवालमेला :-

यह त्योहार प्रतिवर्ष रक्षाबंधन के दिन चम्पावत जिले के देवीधुरा नामक स्थान पर मनाया जाता है। यह मां बाराही मंदिर में मनाया जाता है। इसे पत्थर युद्ध भी कहा जाता है। इस युद्ध में चार समूह होते हैं। प्राचीन काल में इस मंदिर में नरबलि की प्रथा थी किंतु समय के साथ-साथ यह प्रथा समाप्त हो गयी और इसके स्थान पर पत्थर युद्ध किया जाने लगा। जिसमें कि चार समूह आपस में पत्थर युद्ध करके एक मानव शरीर के बराबर रक्त का दान मां बाराहीको अर्पण करते हैं।

धार्मिकस्थान :-

चार धाम, चट्टानों को काटकर पहाड़ों पर बनाये गये हैं। जो कि दुर्गम मार्गों से होकर जाते हैं। उचाई वाले स्थानों में हिमाच्छादित ग्लेशियर पाये जाते हैं जिनमें पिण्डारी, कफनी, सुदंर ढूंगा, मिलम आदि प्रसिद्ध हैं। याक बर्फीले स्थानों पर सामान ढोने का काम करते हैं।

अपनी उपर्युक्त विशेषताओं के कारण ही उत्तराखण्ड ना केवल भारत में अपितु पूरे विश्वमें अपनी अद्वितीय पहचान रखता है। और विभिन्न प्रसिद्ध मंदिरों का घर होने साथही यहां के देवतुल्य मनुष्यों के कारण देवभूमि के नाम से प्रसिद्ध है।

“ऋशियों की यह तपोभूमि उत्तराखण्ड है अपने आप में महान, उस देवभूमि उत्तराखण्ड को करूं में शत-शत प्रणाम”।



Aranyam

PHOTO Gallery

Suman Bhowmik
RFO Trainee, 2015



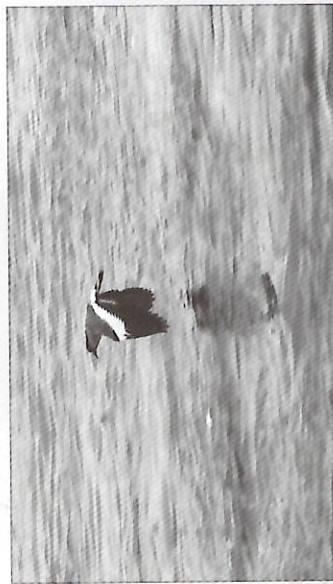
Baronet



Common leopard



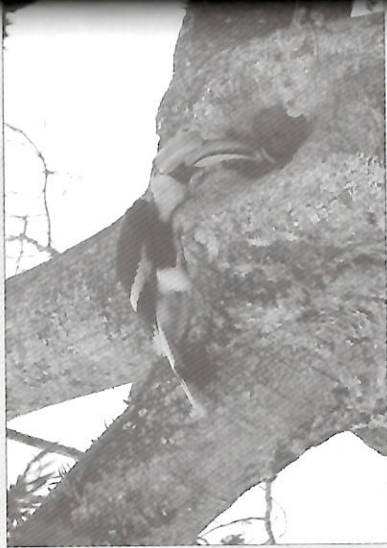
Common rose



Indian common crow



Gharyal



Great Indian Hornbill



Hollock gibbon



Indian common crow



Aranyam

BIODIVERSITY OF INDIA

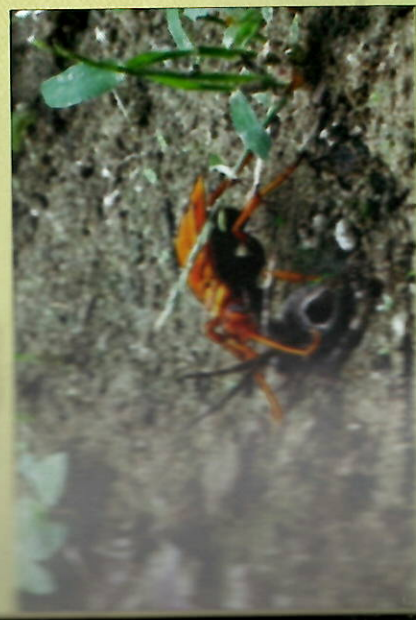
-By Ms. Kalpana Homkar Chinchkhede



Glory Lily (*Gloriosa superba*);
Family: Colchicaceae



Blue Banded Bee (*Amegilla cingulata*);
Family: Apidae



Spider wasp (Pompilid Wasp);
Family: Pompilidae



Yellow Potter Wasp (*Delta campaniforme*);
Family: Vespidae



Lynx spider; Family: Oxyopidae; showing leg bristles.



Red Marsh Hawk (*Orthretum chrysis*);
Family: Libellulidae

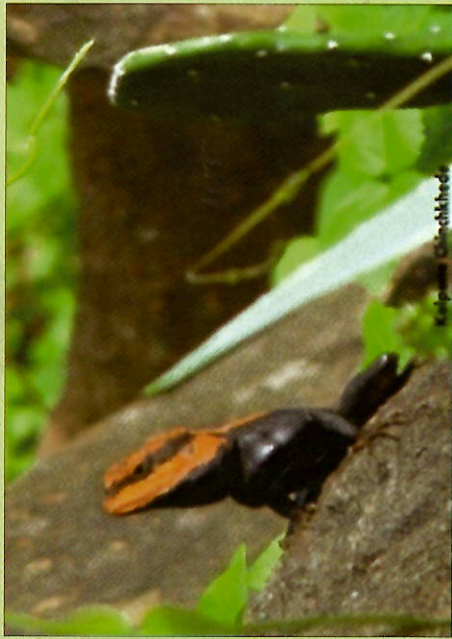


Aranyam



Kalpene Chinchhede

Plum-headed Parakeet (*Psittacula cyanocephala*);
Family: Psittacidae



Kalpene Chinchhede

Rock Agama (*Psammophilus dorsalis*);
Family: Agamidae



Red Fiddler Crab; Genus: *Uca*;
Family: Ocypodidae



Kalpene Chinchhede

Rounded Pierrot (*Tarucus extricatus*); Family: Lycaenidae



Kalpene Chinchhede

Tiger (*Panthera tigris*); Family: Felidae



Collared Scops Owl (*Otus bakkamoena*);
Family: Strigidae



Kalpene Chinchhede

Hobby Starling (*Sturnus pagodarum*);
Family: Sturnidae



Kalpene Chinchhede

White-throated Kingfisher (*Halcyon smyrnensis*);
Family: Alcedinidae



Spotted Deer (*Axis axis*); Family: Cervidae

Aranyam



Kalpene Chinchhede

Black Scorpion (*Heterometrus longimanus*);
Family: Scorpioniidae



Kalpene Chinchhede

Nymphaea; Family: Nymphaeaceae



Kalpene Chinchhede

Baya Weaver (*Ploceus philippinus*);
Family: Ploceidae



Aranyam



Saltwater Crocodile (*Crocodylus porosus*);
Family: Crocodylidae



Giant Wood Spider (*Nephila*);
Family: Nephilidae



Wood Sandpiper (*Tringa glareola*);
Family: Scolopacidae



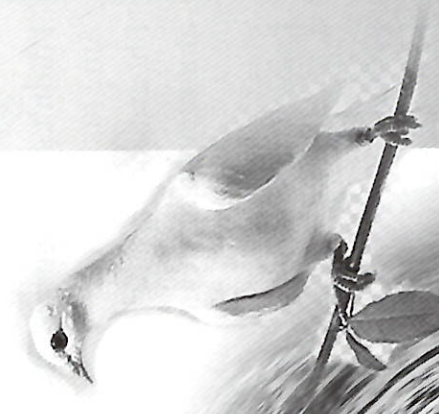
Asiatic Lion (*Panthera leo*); Family: Felidae



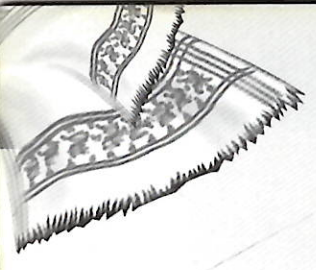
Weaver Ant (*Oecophylla smaragdina*);
Family: Formicidae



Himalayan Bulbul (*Pycnonotus leucogenus*);
Family: Pycnonotidae



From bottom of Heart



BLACK STRIPES

Ms. Kalpana Chinchkhede
RFO Trainee, 2014-15 Batch

I didn't see a tiger till date
Am I just too late?
I heard they are declining
at a very fast rate!

I saw it in a film
mighty and gorgeous,
running after a prey
fast and ferocious!

I saw it in a photograph
standing in the tall grass,
blending due to black stripes
good case of camouflage!

I want to see its magnificent gait
at the backdrop of sunset,
I want to see it doing "catwalk"
on the green ramp of forest!

I want to click it while it relaxes
in a pool of water,
but till date no luck
I don't know what's the matter!

I have been going to the forest

to catch a glimpse of this beauty,
hope is always there
but sighting is not a guarantee.

While they are still around
I want to see them just once,
what if they go extinct?
I don't want to miss the chance.

So to conserve them
I too must lend a hand,
try to spread awareness
stand up & take a stand!



-By Ms. Kalpana Chinchkhede

Dreams....A reality

Dreams.... Its all about reality of life
Not with the clenched one but with the open
eyes

Dreams are so meaningful,
When we mix our feelings with it,
to get what we want in life,
And what to retain for while....

Dreams like a charm to everyone,
their passion and hope for someone,
to discover one's real world and
to achieve our goals in life,
Dreams are the path to reach over there
covering few miles....

Life gets only once,
but dreams have so many lives,
so live the way that one can turn his dreams
into reality
having fullness of love, kindness and
purity...

Amit Kumar Gwasikoti
RFO Trainee 2015-16 Batch

LIFE A blessing

Life is a journey of our deeds...
Which go across through this world
There is no destination, no path and no milestone
It is just we, who can make own it's own

Sometimes we feel, so many obstacles
Sometimes it is like a hell
Most of the time like everything is fading away....
And feeling of emptiness..
In so many clicks, when we feel it is an end of life?
But life does never get end.....

It is quite tough to go with this
But still we all want it, need it and live it
Life is a mystery, it is a maze....
Only we can find a way, by being as pure as child

Because life is a virtue, it is a blessing
And we must be thankful to god
For such a beautiful earning.....

Kiran Shah
RFO Trainee 2015-16 Batch



"Art is man's Nature, Nature is God's Art..."

SAVE FOREST, SAVE LIFE

Tanuja T. Thorat
RFO Trainee, 2015-16 Batch

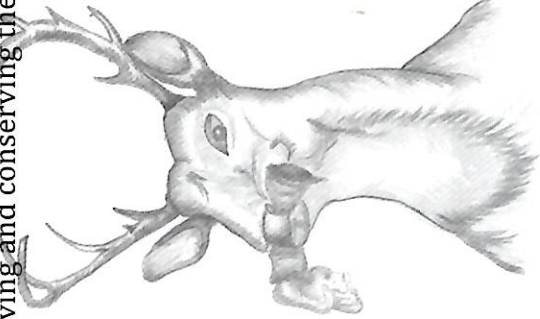
As I woke up early one morning and walked around the campus of our Academy,
I saw a multitude of colours- purple, yellow, red and lavender;
Displaying on the flowers of a leafless tree,
That tiny honey bees and colourful butterflies couldn't resist but kept hovering around!

I heard the sweet calls of "Kokilas" (Asian Koel),
As though in deep conversation.
The drops of water on the blades of grasses and the leaves of trees
Were like diamonds under the sun's reflection.

The breeze that touched me,
Was full of natural fragrance of flowers that emit.
The pleasant environment created by the trees,
Standing tall amongst the colourful flowers;
Is a sight beyond explanation!

The awesome picturesque of this beautiful morning scene
Made me realized the "Creator",
Who created these beauties around us.

Is it not our prime duty to protect this forest?
For destruction of forest means
Ultimate destruction of our life and the future generations!
So lets step up for saving our lives
By saving and conserving the Forest.



Sachin Shinde

Hello, I am also changing.....
my food habit.....???

A PAIR OF EYES

A K Painuly
RFO Trainee, 2015-16 Batch

A pair of eyes as agile as butterfly
Darts here and there, this flower to that one.
And turn about the very next moment.

A pair of eyes awakes the child within
Who longs to chase the naughty butterfly
from Dawn to dusk and even in dreams.

A pair of eyes allures the impatient adolescent
Feeling uneasy and turbulence
to have a glimps anyways.

A pair of eyes makes the man
more than enthusiastic
to read between the lines

A pair of eyes reminds me of
the promises made to
someone special.

A pair of eyes makes me aware
of my responsibilities
and liabilities

A pair of eyes speaks some unspoken words
Which sounds that
I may get the desired friend

A pair of eyes often instrumental
In helping me out
To know myself

A pair of eyes relives me
off all my follies, worries
and unwarranted agonies

A pair of eyes holds me strongly
To enable me to keep my
Feet firm on ground.



COLOURS OF FLOWERS

What does colours of flowers says,
have you ever notice that ????
Colours of flowers says,
Fill all colours in your life.....

Yellow colour flowers says,
I am joy and happiness.....
So, always wear a smile on your face....

Red colour folwers says,
I am sacrifice and love.....
Sacrifice, whatever you can do...

Purple colour flowers says,
I am beauty of nature.....
So, be beautiful and confident....

Pink colour flowers says,
I am pureness.....
Be pure and be happy....

Blue colour flowers says,
I am patience....
Stay cool and calm, in every situation...

Orange colour flowers says,
I spread energy everywhere....
Be energetic in every field of life...

Colours of flowers inspire us,
How to live our life.....
So, enjoy every colour of your life.....

Soniya Kumari
RFO Trainee, 2015-16, Batch

To succeed in your mission you must have single minded devotion to your goal.

जिंदगी एक सफर

चलते-चलते शाम हुई,
रूँ ही जिंदगी तमाम हुई।
सोचा भी ना कभी,
रूँ ही सुबह से शाम हुई।
जब भी सोचा कुछ करने का,
सवालोंने की बरसात हुई।

कब, क्यों, कहाँ, कैसे
ऐसे ही बस बात हुई।
करते थे सबका शुक्रिया हम,
फिर क्यों ये बात हुई।
जाने जिंदगी किस मोड़ पर ले जायेगी अब,
रह-रह कर दिल में ये बात हुई।

अब तो चलते रहना है आगे बढ़ना है,
क्यों मैं सोचूँ, कहाँ दिन कहाँ रात हुई।
मुश्किलों को जीत कर बढ़ना है आगे,
बस यही मेरे लिये जीने की आस हुई।

Aloki
FRO Trainee, 2015-16 Batch

बूँद....

मैं हूँ बूँद
कभी संभलती, कभी फिसलती।
कभी लुढ़कती नभ से तो,
कभी टपकती आखों से।
मैं ना जानूँ भेद करना,
मैं बस जानूँ गिरना, फिर संभलना।

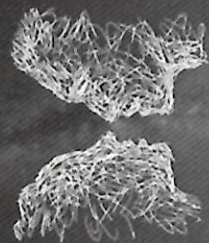
बूँद-बूँद से मिलकर बनती,
बूँद-बूँद में जा बिखरती।
बूँद-बूँद है जर्ज मेरा,
बूँद-बूँद ही जरिया मेरा।
मुझसे बना अथाह समंदर,
फिर भी क्या अस्तित्व हे मेरा?

जन-मानस की प्यास बुझाती,
कभी खटकती कभी सुहाती।

नन्हीं सी इठलाती सी,
हूँ मैं छोटी-प्यारी सी,
लुढ़कती-टपकती-संभलती-फिसलती
हूँ मैं बड़ी शान से,
खुश हूँ इस पहचान से।

Amit Kumar Gwasikoti
RFO Trainee, 2015-16 Batch

Inside
every person
you know, there's
a person you
don't know.



Spirit Science

मेरी माँ

माँ जिसकी कोई परिभाषा नहीं,
जिसकी कोई सीमा नहीं,
जो मेरे लिये भगवान से भी बढ़कर है,
जो मेरे दुख से दुखी हो जाती है,
और मेरी खुशी को अपना सबसे बड़ा सुख समझती है,
जिसकी छाया में मैं अपने आपको महफूज,
समझती हूँ, जो मेरा आदर्श है,
जिसका ममता और प्यार भरा आंचल मुझे,
दुनिया से सामना करने की शक्ति देता है ।
जो साया बनकर हर कदम पर
मेरा साथ देती है,
चोट मुझे लगती है तो दर्द उसे होता है,
मेरी हर परीक्षा जैसे,
उसकी अपनी परीक्षा होती है,
माँ एक पल के लिये भी दूर होती है तो,
जैसे कहीं कोई अधूरापन सा लगता है,
हर पल एक सदी जैसा महसूस होता है,
वाकई माँ का कोई विस्तार नहीं,
मेरे लिए माँ से बढ़कर कुछ नहीं

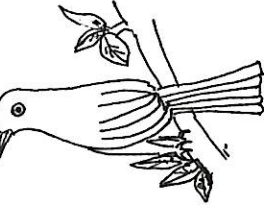
Km. Lucky Shah
FRO Trainee, 2015-16 Batch



अस्तित्व

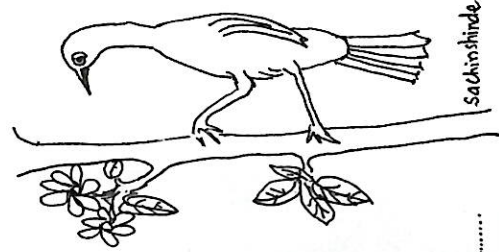
क्यों नहीं है अस्तित्व की पहचान अभी,
जान के भी बनें हैं अनजान सभी ।
समर्पित स्वयं को करके भी
मांग ना पायी अपनी पहचान कभी
जागते सोते बस यहीं हूँ सोचते रही
कि क्यों न परख पाया वो मेरे एहसास कभी,
चाहतों के परों को काट डाला सभी
और मन के दरवाजों पर भी डाला ताला अभी,
फिर भी उसके अक्स की परछाई दिल में है रखी
जहाँ उसने देखने की भी नहीं की जहमत कभी,
भुला न पाऊँगी उसका ये एहसान कभी,
जो न महसूस कर सका मेरा अपमान कभी ।

Sanchita Verma
FRO Trainee (Batch 2015-16)



चिड़िया ओ चिड़िया

कहाँ है तेरा घर?
उड़-उड़ आती है
जहाँ से फर-फर?
उड़-उड़ जाती है
जहाँ को फर-फर?



दुमली के एक
बड़े भारी पेड़ पर,
दास-पुस-तिनकों से
बना मेरा घर.
उड़-उड़ आती हूँ
वहाँ से फर-फर?
उड़-उड़ जाती हूँ
वहाँ को फर-फर?

- हरिकेशराय बरकान

Sachinshinde

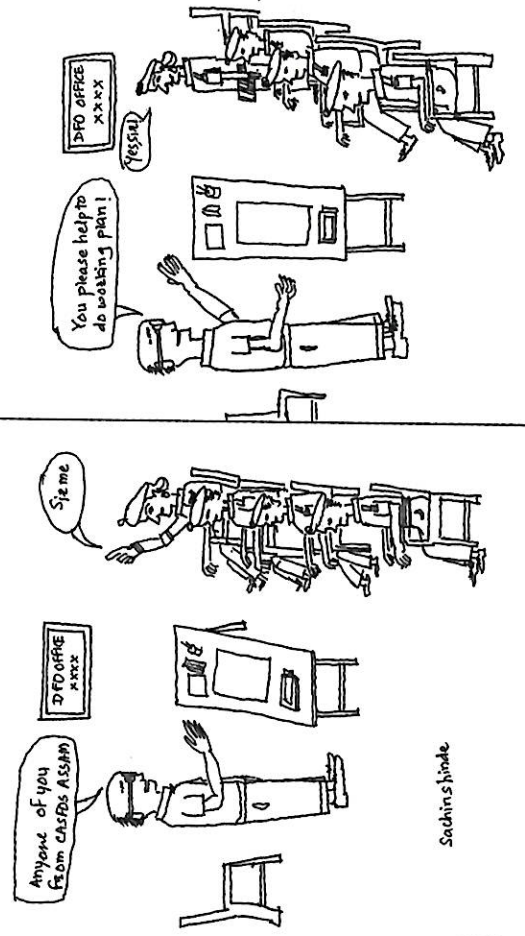
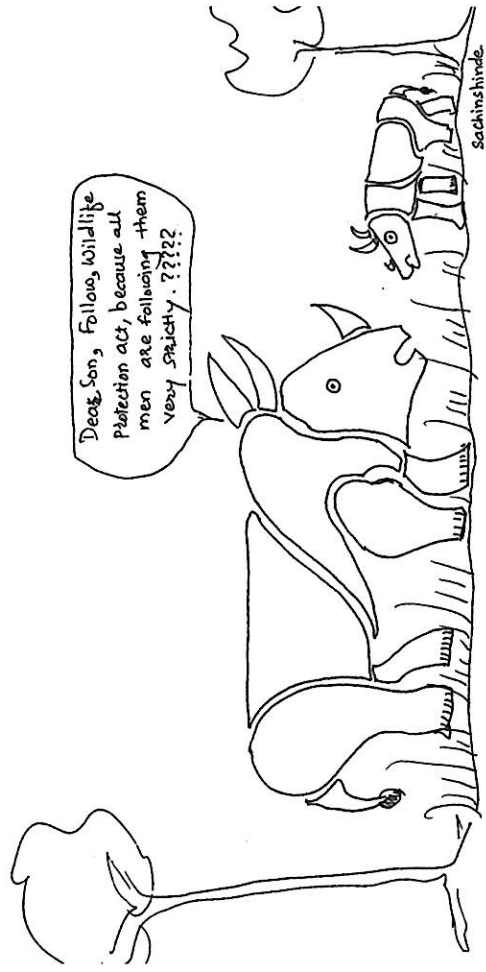
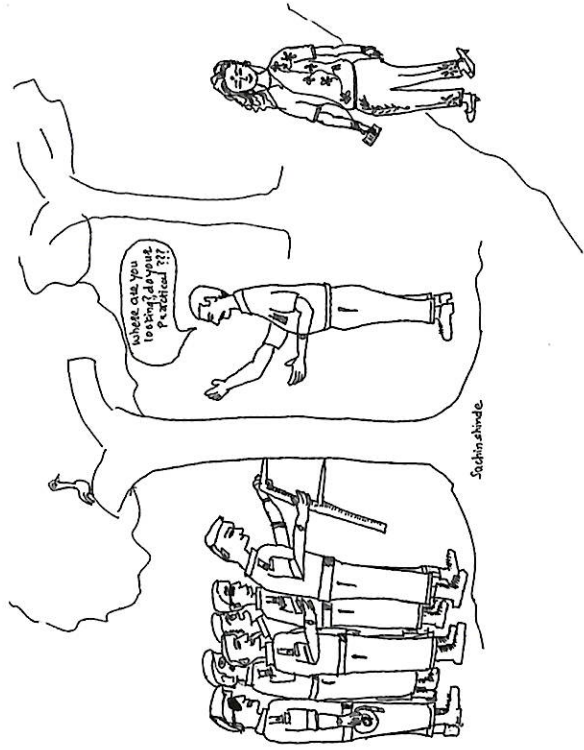
**Being honest
may not get you
many friends, but it
will always get you
the right ones.**

John Lennon



Spirit Science

Art Gallery





औकात ही क्या जिंदगी की
जो हमें नाराज कर दे
हम तो आबारा बादल है
चल देंगे एक दिन जिंदगी को नाराज करके

जब मंजिल तूने पाली हो
खूशियों से भरी तेरी थाली हो
जब कंधा तेरा खाली हो
तब छोड़ देंगे दुनीया
बस आँख तेरी ना गीली हो
बस आँख तेरी ना गीली हो

किस्मतपे यकीन हमने कब किया जो आज करेंगे
रेहमत की उम्मीद हमने कब कि जो आज करेंगे
मौत से खेलने का शौक हम आज भी पालते है
या खुदा त् चाहे जितने गम देदे
तुझसे शीकायत हमने कब कि जो आज करेंगे
बिता लम्हा फिर से मिलता नहीं
मूरझाया फूल फिर से खीलता नहीं ।
जो वक्त के साथ बदलता नहीं
वक्त उसके लिए कभी रुकता नहीं ॥

अफ़सोस नहीं के
तारे बनकर टीम टीमा न सके
हमे फ़क्र है चिराग बनकर ही सही
किसीका आशयाना तो रोशन कर सके
आसमां पर बैठे हुए को गिरने का डर
जमी पर बैठे हुए को कूचले जाने का डर
ये डर इनसान को जिंदा रखता है
पर जिंदगी जिने नहीं देता



नाप आया हूँ समंदर की गहराई
छू आया हूँ हिमालय की चोटी^{पुण}
ना समंदर गहरा है मेरे माँ के दिल से
ना हिमालय उँचा है मेरे पापा के कद से^{पुण}

हाल ना पूछो दर्द,ए,दिल का
आँसूओं का सैलाब उमड आयेगा
दुनिया क्या चीज है
इसमें खुदा भी बह जायेगा

वो दर्द ही क्या जो आखोंसे छलक जाये
वो खूशी ही क्या जो ओठों पर ना आये
कभी तो समझो हमारी खामोशियों को
वो जब्त ही क्या जो लपजों से बयां हो जाये

दुश्मनी का नाता दोस्ती जैसा ही है
अंतर बस इतना है
दुश्मनी आपका हुनर तराशती है
दोस्ती आपका हुनर सराहती है।

20th Annual Sports Meet 2015



FOREST RANGE OFFICER TRAINEES, 2014-2015 BATCH



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FOREST RANGE OFFICER TRAINEES, 2014-2015 BATCH



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FOREST RANGE OFFICER TRAINEES, 2014-2015 BATCH



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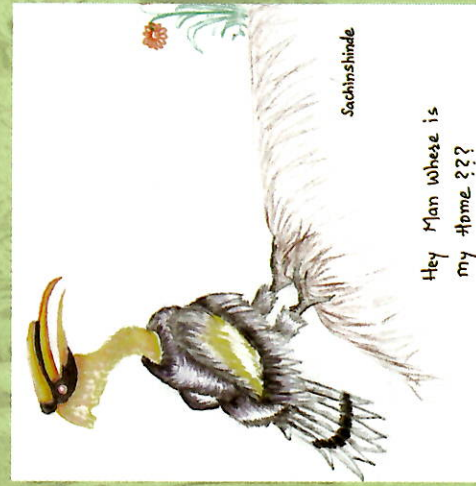
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FOREST RANGE OFFICER TRAINEES, 2015-2016 BATCH



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P.S- Challengta
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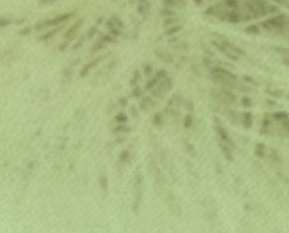
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FOREST RANGE OFFICER TRAINEES, 2015-2016 BATCH



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TANUJA TULASHIRAM THORAT
D/o. Tulashiram Laxman Thorat
C/o. Onkar G. Shelar
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Maharashtra, Pin: 411015
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FIRST ROW (LEFT TO RIGHT) : SHRI C. A. RAHMAN IFS (LECTURER), SHRI. N. LUKHAM IFS (PRINCIPAL), SHRI. AJAY RAJAK (PT & GAMES INSTRUCTOR)

SECOND ROW (LEFT TO RIGHT) : SUMAN BHOWMIK, SUNIL KUMAR, SANCHITA VERMA, TANUJA THORAT, SONIYA KUMARI, RAKHI JUYAL, MITA DAS, KIRAN SHAH, LUCKY SHAH, JAYASHRI TRIPURA, BHABANI DEBBARMA, ALOKI, MAMTA CHAND.

THIRD ROW (LEFT TO RIGHT) : VINOD CHAUHAN, JEWEL DEBBARMA, RATNAJIT CHAKMA, VIJAY SAINI, ANIL KUMAR PAINUPLY, KANHAIYA LAL, BINDER PAL, ANIL SINGH RAWAT, UNAY NAND GAUR, SACHIN S SHINDE, SADHU LAL, VIKAS RAWAT, KISHORE KUMAR NAUTIYAL.

FOURTH ROW (LEFT TO RIGHT) : BISHAN LAL ARYA, KUNALJIT DEBBARMA, LALIT KUMAR, AMIT TRIPURA, AMIT KUMAR GWASIKOTI, TAPAS DEBBARMA, MUKESH KUMAR, JUGAL CHAUHAN, DINESH KUMAR NAUTIYAL, BIBRATA MARAK, RAJKUMAR, ANIL KUMAR JOSHI, SANDEEP GIRI.