

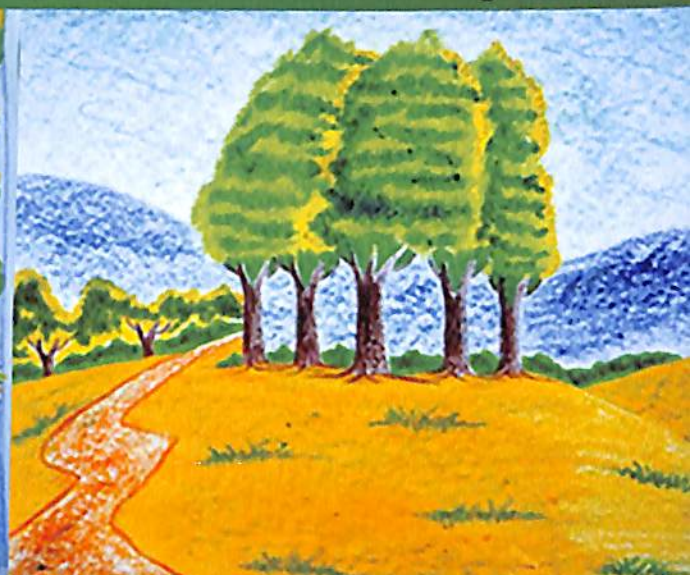


Nature

- A Multilingual Annual Publication of the SOPEC

Vol - 5

June 2016 - May 2017



SOCIETY FOR ENVIRONMENTAL CONSERVATION (SOPEC)

D. H. S. K. COLLEGE, Dibrugarh (Assam)
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FOR THE CURRENT YEAR : 2016- 2017**

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Secretary, SOFEC, 5th June, 2017



SOCIETY FOR ENVIRONMENTAL CONSERVATION (SOFEC)

D. H. S. K. COLLEGE
Dibrugarh (Assam)

NATURE : A Publication of the Society for Environmental Conservation (SOFEC), D.H.S.K. College, Dibrugarh

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THE 5TH VOLUME OF *NATURE* IS DEDICATED
IN FOND MEMORY OF



LATE DIMBESWAR CHALIHA, M. Sc. (B.H.U.) (1936-2017)

Naturalist, Writer, Educationist & Social Worker

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(Dibrugarh Science Society, 1969)

.....By Editor

Principal's Message

At the outset, I convey my best wishes to SOFEC for their wholehearted efforts to publish yet another edition of Nature; an annual environmental journal. The other day when RajibLochan Borah, the present editor of Nature, informed me that he is soon going to publish this annual journal of SOFEC, I was so much overwhelmed with immense joy. Since its inception SOFEC has borne all the pains to bring out this journal every year as part of its initiative to spread environmental awareness. This is indeed a praiseworthy healthy practice on the part of SOFEC. The circulation of this journal amidst the faculty and students of DHSK College no doubt helps in generating awareness regarding environmental conservation within the college community. I take this opportunity to thank each and every member of SOFEC for successfully publishing each issue of this environmental awareness journal. In addition to this noble initiative on the part of SOFEC, DHSK College has also initiated two significant initiatives - Nature Interpretation Centre and Anthropological Museum and Photo Gallery of Ethnic Communities. Nature Interpretation Centre is perhaps the first such centre ever initiated by a college to arouse interest in Nature not only among grown up folks but also amongst young children. Once again I convey my best wishes and compliments to the editor and his team for their earnest team work in bringing out this edition of Nature.



Dr. Sashi Kanta Saikia
Principal
D.H.S.K. College, Dibrugarh

EDITORIAL

Nature is a Multilingual & multidisciplinary annual publication by SOFEC of DHSK College, Dibrugarh. Society for Environmental Conservation (SOFEC) is an organization of like-minded teachers, staffs & students of DHSK College & it was founded in 2002 with its basic objective to bring mass awareness on environment, particularly targeting the student community & also to protect & conserve environment in the locality. I am very much honored to take up the responsibility of editing this publication with the help of my co-editors. This volume is enriched with fourteen writings including twelve articles, one poem & one song related to environment, nature & ethno-biology. The beauty of the issue is that writings of three languages viz. Assamese, Hindi & English are presented. Important SOFEC events, Drawings of children in drawing competition etc. which were conducted during 2016 June to 2017 May are also highlighted in images.

I owe my gratitude to our Principal Dr. S.K. Saikia for his encouragement & support in Bringing out this publication. Finally, I am sincerely thankful to all the contributors & members of the Editorial Board & Office - Bearers for their kind help & cooperation without which it wouldn't have been possible for the publication.



(Rajib Lochan Borah)

Editor, *Nature*,

SOFEC, 2016-17

DHSK College, Dibrugarh, Assam

CONTENTS

গীত কল্পনা সেনগুপ্ত বৰুৱা	1
একীকৃত কৃষি প্ৰণালী (Integrated Farming System) কল্পনা সেনাগুপ্তা বৰুৱা	2
প্ৰকৃতি প্ৰেমী ড° ভাৰতী দত্ত	3
INDIA AS A TRIBAL POPULOUS COUNTRY IN RELATION TO FOREST & NATURE Dr. T. Bhengra	4
FLUORIDE POLLUTION IN GROUND WATER Dr. Sikhamoni Sarmah	7
TRADITIONAL FISHING GEARS IN ASSAM WITH SPECIAL REFERENCE TO DIBRUGARH DISTRICT Sultana Hazarika	10
STUDY OF SOIL MITES AND DR. ASHIT KR. DATTA Tikendrajit Gogoi	18
ENVIRONMENTAL ENGINEERS-THE SPIDERS Ms. Sudakshina Das	22
ETHNO-MEDICINAL PRACTICES AMONG THE MISHING Bhaskar Das	25

BIOFUELS -A HOPE FOR FUTURE Dr. Alakananda Baruah	28
AQUAPONICS - THE FUTURE OF SUSTAINABLE FARMING Dinalisha Bora	30
OPEN CAST MINING AND ENVIRONMENTAL DEGRADATION Dr. Bhaswati Kakati	34
কাৰ্বি লোকসাহিত্যত প্ৰকৃতি অনন্ত টেৰণ	36
পাৰিপাৰ্শ্বিক নিয়ন্ত্ৰণত পৰিৱেশ নীতিশাস্ত্ৰৰ প্ৰাসংগিকতা ৰমা কান্তি দাস	42
SOME MOMENTS OF SOFEC ACTIVITIES DURING 2016-17 IN IMAGES	45
LIST OF MEMBERS OF THE SOCIETY FOR ENVIRONMENTAL CONSERVATION (SOFEC), 2016-2017	46
SOFEC ACTIVITY LIST, 2016-17	47
MEMBERSHIP REGISTRATION FORM	48

গীত

ৰচনা আৰু সুৰ : কল্পনা সেনগুপ্ত বৰুৱা
উপাধ্যক্ষা আৰু মুৰব্বী অধ্যাপিকা হিন্দী বিভাগ

গছ বন নেকাটিবি ভাই
গছ বনে ধৰণী শুৱায়।
গছ বন নেকাটিবি ভাই
গছ বনে ধৰণী শুৱায়।
গছ বন।

সৰাপাত সৰি পচি পৃথিৱী ভৰায়
সাৰ হৈ সিয়ে মাটিত মিলি যায়
উৰ্বৰতা বঢ়ায় আৰ্দ্ৰতাও বঢ়ায়
দেশৰ অৰ্থনীতিৰ বহণ চৰায়।
গছ বন।

ছায়াখন গছবোৰে দেহমন জুৰায়
উৎকট গৰমো ইয়ে কমায়
বহু জীৱ জন্তুৰ বসতি ঠাই
পখী কাকলিয়ে নিশা ইয়াতে জিৰায়
বনজ সম্পদ বঢ়ায়
পৰিৱেশো সজায়
দেশৰ অগ্ৰগতিত সঁহাৰি জনায়।
গছ বন।

एकीकृत कृषि प्रणाली (Integrated Farming System)

कल्पना सेनगुप्ता बरुवा

उपाध्यक्षा, डि.ह.सू.कनोड़ महाविद्यालय

एकीकृत कृषिप्रणाली सभी कृषिप्रणाली का प्रबंधित रूप है जिसका उद्देश्य लक्ष्य ही होता है ज्यादा स्थायी कृषि। यह एक गतिशील दृष्टिकोण है जिसे दुनिया के किसी भी कृषिप्रणाली में प्रयोग में लाया जा सकता है। आज विश्व की जनसंख्या जिस तरह बढ़ रही है उसकी मांग पूर्ति के लिए यह कृषि प्रणाली अत्यन्त सार्थक और सफल है।

प्राकृतिक कृषि प्रणाली और एकीकृत कृषि प्रणाली में अन्तर यह है कि यहाँ खाद्य उत्पादन के लिए नए टेकनोलाजी की इस्तेमाल होती है जिससे अधिक उत्पादन होती है और इसके चलते कृषकों की आर्थिक वृद्धि होती है।

एकीकृत कृषि में विभिन्न प्रकार के कार्यों में कौशल की मांग होती है जैसे सुअर, बत्तख, मुर्गी पालन, अनाज, सब्जियाँ, फार्मींग, घास उगाना, जलीया पौधे, मछली की फार्मींग आदि। यह प्रणाली तकनीकी रूप से आधारित कौशल, घरेलु

आवश्यकताओं को पूरा करने में बहु आयामी भूमिका निभाती है, नए रोजगार के अवसर पैदा करते हैं, संसाधनों के राष्ट्रीय और टिकाऊ उपयोग को सक्षम करता है।

यह प्रणाली पहले चीन देश में प्रयोग करके कृषि क्षेत्र में बहुत उपकृत हुआ था। वर्तमान समय में यूरोप आदि उन्नत देशों में यह प्रणाली चालू है। अपने परिवार की पुष्टिसाधन, समाज, देश की उन्नति के साथ कृषकों को आर्थसामाजिक अग्रगति के राह पर अग्रसरित करने के लिए एकीकृत कृषि प्रणाली ही सर्वोत्तम है।



প্ৰকৃতি প্ৰেমী

ড° ভাৰতী দত্ত
সহযোগী অধ্যাপিকা (অৱসৰপ্ৰাপ্ত)
ভূগোল বিবাগ

নৈ, বিল, জান, জুৰি
পৰ্বত, পাহাৰ, সাগৰ, মহাসাগৰ
গছ-লতা, ফুল, পখিলা
জীৱ-জন্তু, চৰাই-চিৰিকতি
আস প্ৰকৃতিৰ কি যে অপূৰ্ব অৱদান
এই সকলোবোৰে প্ৰেমত বন্দী মই
প্ৰকৃতিপ্ৰেমী,

পিছে হৃদয় মোৰ ভাৰাক্ৰান্ত
দেখি প্ৰকৃতিৰ ৰূপ অৱনমিত
জীৱশ্ৰেষ্ঠৰ নিষ্পেষণৰ বলি প্ৰকৃতি
নৈ, বিল, জান, জুৰি হ'ল আজি প্ৰদূষিত
ঔদ্যোগীকৰণ, নগৰীকৰণ আৰু প্ৰযুক্তিৰ বিক্ৰম
অৰণ্যৰ লুণ্ঠন, ভূমিৰ আশ্ৰাসন
নৈঃশব্দত ধৰ্ষিতা ধৰণীৰ চিৎকাৰ
ওঁহো নোৱাৰি ৰ'ব নিঃশব্দে, নিমাত্তে
প্ৰকৃতিপ্ৰেমী মই

লালোঁ মই পগ
ৰুধিব লাগিব এই অন্যায়া-আচৰণ
কৰিব লাগিব প্ৰকৃতি সংৰক্ষণ
বিলালোঁ বাণী, নগৰে, চহৰে, গাঁৱে, ভূঞা
কৰমৰ যজ্ঞ চানেকিৰে দিছোঁ পৰিচয়।

(‘চ’ফেক’-ৰ প্ৰতি উৎসৰ্গিত)

১৩-০৫-২০১৬

INDIA AS A TRIBAL POPULOUS COUNTRY IN RELATION TO FOREST & NATURE

Dr. T. Bhengra

Associate Prof. Deptt of Pol. Sc.

Introduction : The tribal cultural heritage, cultural traits & elements completely belong to entirely whole tribal community. The tribal folk traditions demonstrate the dominant characteristics of their basic culture. The tribal cultural heritages are traditionally informal in form, oral, and very much unaffected due to mainly folk based traditions. The tribal folk culture composites of folklore & a collective combination of others such as myths, legends, tales, proverbs, riddle, ballads, songs, rituals, dances, music, ornaments, sculptures, medicines & wooden carvings etc. It also comprises of least tangible expression, signs & aesthetic aspects of culture is the reflection of their daily life.

Tribal people of India : India comprises of multi-ethnic, multi-linguistic, multi-cultural,

multi-religious country, which is most populous country in the world next to China. In India, tribal society has a special important place and it is the second most tribal populous area in the world in comparison to the black continent Africa. The tribal inhabitants are the earliest settlers of this sub-continent. India has 8.21% tribal population with 577 tribal groups according to the census 2001. In Indian society, tribal culture has its own importance by its own heritage and it is nurtured on the blossom of mother earth. Every tribe of India dwell in the forest, hills & they isolate themselves into some specific regions & accordingly, the tribes are known as either the people of the forest & hills or the original inhabitants. The tribes are known by different names such as Vanvasi (inhabitants of forest), Pahari (hill dwellers), Adimjati

(original communities), Adivasi (first dwellers), Janajati (Folk people), Anusuchit Janajati (Scheduled tribe) etc. Among the above branded terms, the most popular, extensively & constitutionally known is the Anusuchit Janajati (Scheduled Tribe) officially covering the entire tribal groups. Tribal groups are always in contact with their neighboring communities largely living by farming & few are employed in industry & service.

A historical profile of the tribal people : In historical analysis we find that tribal are an integral part of the greater Indian civilization & they have contributed a good number of elements to the early civilization of India. The analysis also establishes that tribal were the earliest inhabitants of the country. There are four main races & cultures welded together. They are (1) Austro-Asiatic with their primitive form represented by Kols & Mundas, the Khasis of North-East & Nicobaris of Andaman Nicobar Island. (2) The Mongoloid people with dialects of Sino-Tibetan family who are found largely among the Sub-Himalayan regions & who are

represented by the Nagas, Bodos, Kukis etc. (3) The Dravidians, the Malars, the Oraons, the Gonds & the Khonds who speak the tongues of the Dravidian family. (4) The Aryans who are supposed to be last to come to India.

Attachment of the tribal people to forests : For all these above mentioned tribes the forests have always had great importance to the tribal people. In pre-historic period tribal people got their food mainly by hunting, fishing & gathering wild plants. Many of the tribal people lived in the forest and thus they were naturally a part of it. With the passage of time, civilization has set in, the tribal people settled in the towns & in cities & even then these tribal people went to the forest to collect their timber & to hunt. Today also the tribal people cannot isolate them from the forest & still need forests more than ever, especially for their economic values like timber & non-timber products. The attachment to the forest has environmental & enjoyment values also. Forestry is concerned with increasing & preserving these values by careful management of forestland. The growth of forest has tremendous role to play to support the life of supporting

sphere of the globe. Nevertheless, the natural growth of forest, the holistic enterprise of mankind is highly counted in the nourishment of the tribal people. The government of India has been taking keen interest in the increase of total vegetation of the country. The government has also taken several projects with regard to tree plantation along railway lines, roadsides and river & canal banks. Trees are also planted by the tribal people in the village common land, waste land & land under the Panchayats. Since a large section of tribal people of India still depends largely on fuel wood & other biomass for their cooking & heating, the government also enacted the Forest Right Act in 2006, to empower the tribes to collect Timber & non-timber products from forests. But, if the demand & dependency of the tribal people on the forest products are not minimized now, the area under forest will be reduced with the growing tribal population due to increased human activities.

Conclusion : It can be safely concluded that the tribal culture in India is considered to be oldest of all cultures of the soil. The life styles of the tribal communities

are closely related to the environment & their culture also nurtured on blossom of the mother India. Since tribal people live in natural & forest areas, they are confined to isolated pockets near jungles where they love to dwell & sustain with their common livelihood in a way free from urban high technological environment. This shows the simplicity of the tribal life & their attachment with the Mother Nature without exploitation.

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FLUORIDE POLLUTION IN GROUND WATER

Dr. Sikhamoni Sarmah

Associate Professor, Dept. of Chemistry

Fluoride pollution is characterized by high levels of fluorides, a family of chemical compounds with a wide range of uses. Fluoride is present in varying amount in almost all types of water, Depending upon the nature of rock and fluoride bearing minerals in the bedrock, ground water may have fluoride from very low to very high values. In the recent years, there has been excessive dependence on ground water to meet potable water needs. If ground water passes through fluoride rich rocks, it dissolves fluoride and the water can have more than an acceptable level of fluoride. Fluorides from industrial discharges may also contaminate water supply.

If is noteworthy that a very small amount of fluoride is required in drinking water to prevent tooth decay. Therefore,

fluoride is added intentionally to public drinking water supply where natural fluoride is low. Optimal level which can prevent tooth decay is from 0.7 to 1.2mg l^{-1} . To meet the requirement of fluorides, it is added in toothpaste. Fluorides in toothpaste helps to remove plaque which can cause gum diseases and tooth decay. Fluoride in various forms is the most popular ingredient in toothpaste, But when the tolerate limit is crossed fluoride ingestion can cause dental fluorides of the teeth. In more severe cases all the enamel may be damaged. Chronic high level exposure to fluoride can lead to skeletal fluoresis where fluoride accumulated in the bone progressively over many years. The early symptoms of skeletal fluoresis include stiffness and pain in the joints. The bone

structure may change and ligaments may calcify resulting in the impairment of muscles, High fluoride exposure in terms of high levels in drinking water and high duration of exposure may lead to crippling skeletal fluoresis characterized by osteosclerosis. Carcinogenicity of fluoride on experimental animals could not be established. No effects have been observed on reproduction, reproductive organs or foetus development. Besides human being, fluoride pollution can also hurt wildlife, especially fish which can be trapped in water with high levels of fluoride and nowhere to go, Fluoride pollution can also damage crops and plants and certain fluoride can contribute to the formation of acid rain.

World Health Organization (WHO) has set the value of fluoride in drinking water at 1.5 mg l^{-1} , However, This guideline value of WHO is not a fixed one but is supported to be adopted in consideration with the local conditions. In India, Fluoresis is a serious national problem, As estimated 62 million people including 6 million children in

India are affected by various types of fluorides. As per WHO, about 10 to 25% of rural population of various states is at risk. The highest concentration to date, has been reported from Rewari district of Haryana i.e. 48 mg l^{-1} . Nalgonda district in Andhra Pradesh is also highly affected by fluorises. Nearly 500 villages in the district are gripped by fluoresis resulting in twenty thousands fluoresis victims in the district. In Nalgonda, the Water contains upto 10 mg l^{-1} of fluoride. Many adults and even young children have been irreversibly affected by skeletal fluoresis in the district.

The treatment system that can regulate the amount of fluoride in water are available. The control of drinking water quality is therefore critical in preventing fluorosis. In all fluoride affected areas it is advised to do rain water harvesting to recharge the groundwater source that shows high fluoride levels. In places where fluoride levels are between 1.5 to 2 mg l^{-1} some nutritional interventions can help. In these places it is

advised to eat foods that are rich in iron, calcium and vitamin C. The use of black salt (Kalanamak) and products containing it, as well as the use of fluorinated toothpaste should be avoided in these areas. Where alternative source of drinking water is not available, defluoridation of drinking water is the only remedy. Defluoridation is the removal of excess fluoride from water. The National Environmental Engineering Institute (NEEI) in Nagpur, India has developed an economical and simple

method of defluoridation which is referred to as Nalgonda Process. This is a commonly used house hold process in villages around Nalgonda. In this method, fluoride is precipitated using 500 mg l^{-1} of alum and 30 mg l^{-1} of lime.

Thus every individual along with government should take important steps to reduce and prevent fluoride pollution. A small effort made by each individual at own place will have pronounced effect at the global level.



TRADITIONAL FISHING GEARS IN ASSAM WITH SPECIAL REFERENCE TO DIBRUGARH DISTRICT

Sultana Hazarika

Assoc. Prof. and H.O.D., Dept. of Zoology

A fishing gear is a tool to make fishing easier. Different types of fishing gears used all over the world, designed in accordance with the condition of the fishing grounds. The types and varieties of fishing gears vary in different fishing grounds like inland water, freshwater and sea water.

Fishing can be considered as one of the main source of living for the people of Assam. Although many villages are much developed but still fishing is always like a passion for the people in Assam.

The principle fishing gears used in Assam with special reference to Dibrugarh district:

1. Wounding gear : Large sized fish are caught by hunting them, using weapons like spear, harpoon, lance and rifles. The fish spear or konch is an ancient gear to kill larger fish when concentrated in a small area. A

spear is a split bamboo shaft 1.50 to 2 m in length, fitted with a conical iron point. It is thrown at the large fish by a man standing on the boat. Larger carps & cat fishes are caught by this method.

2. Traps : These are stationary uncovered pound nets to herd the fish into the final "room" pots with or without baits, tyke nets, stow nets for rivers and used in strong currents and various barrier or fence nets, wires and fish corrals and aerials traps to trap jumping fish onto the veranda.

3. Dredge : These are gears dragged along the bottom to collect fishes at the bottom level. The catch is held in a sort of bag or sieve which allows the water, sand and mud to run out.

4. Line fishing (Borokhi) : This method has been in use for long time, the principle of which is to offer a real or artificial bait to

entice the fish, which is then unable to release the bait and is lifted from the water.

5. Fishing by baited springs : A strong but flexible pipe of bamboo pointed at both ends is used as a spring. Its two ends are bent till they nearly meet and are carefully adjusted within the body of a grasshopper, cockroach or a small frog serving as bait. This is then suspended in water by means of a string to which a float is also attached. It is used in catching murels.

6. Fish screens (Fasijaal) : Slender bamboos are worn to form a screen or chichi of about 10m length & 1-1.5m width. The screen is set to surround a shallow tidal area at the time of high tide. When the tidal flood water recedes, the fish are left behind in the muddy pool & re-collected. The screen is also set to mark off shallow areas of rivers. The enclosed space is divided into smaller enclosure by putting up earthen bunds. Water is then baited out to expose the fishes. This method is employed to catch carps, catfish, murels etc.

7. Fish traps (sepa) : Various types are used to lure the fish to

get in but are prevented from escaping. A basket trap nets consist of two dome shaped hemispherical baskets, each provided with an opening at the narrow end. The opening is graded by flexible recurved bamboo sticks with their free ends facing towards inner side. Suitable bait in the form of balls is generally placed in the trap which is lowered in water for some times, so that fishes entering the basket are unable to get out due to the recurved nature of sticks guarding the opening.

8. Dingora : It is a wide mouthed earthen pot or vessel used as trap. The mouth is closed with a thick cloth having few holes to provide entrance. Suitable bait placed inside the pot induces the fish to enter the pot which is placed at the bottom of the river or pond.

9. Poloh : Live fishes like *Channa*, *Heteropneustes* and *Clarias* are caught by a trap called cover pot or basket trap. It is made up of bamboo pieces in the form of a conical basket, open at both ends. The basket is about 1m height and is used in shallow muddy water.

10. Juluki : It is also a basket

type trap made of bamboo & cane similar to 'poloh'. But it is a bit smaller to the corner. It is also made up of split bamboo pieces in the form of a conical basket, open at both ends. It is carried by the fisher man in the similar way like the poloh.

11. Thuha : This gear is also made of bamboo & cane. It is made up of split bamboo pieces in form of conical flask or basket at the top & the lower end is narrower like a tube in which the fishes are being trapped. The opening of the conical mouth is wide open from where the fishes enter inside the gear along with the flowing water & trapped in the narrow portion.

Trap for jumping fish :

12. Lengijal : A few species of fish have developed the habit of jumping out of water at intervals, or when excited or in danger. Taking advantage of this habit, a horizontal net called lengijal is fixed in water or in a moving boat, is used to catch them when they fall back.

13. Dip net or lift net : Dip nets are of several shapes & are lowered into the water in the hope that fish would swim over them and lifted out of water.

They are triangular, rectangular or square & are fitted round a frame. Some bait are often put on the net or suspended over it to attract fishes. The smaller nets are operated by hand & the larger ones are dipped and lifted from the water by a long pole which is used like a lever. The original simple hand dip nets have gradually been transformed into permanently stationary lift nets, operated from bridges made of bamboos. Dip nets are categories into following four names: (KHORA JAL, PAH JAL, KAH JAL, BERHRI JAL)

13a. Helajal : It is triangular net of cotton consisting of 2 light bamboos each 2.5m long crossing each other at one end to form a V-shape. A short cross stick, about 50cm long, is fixed near the apex of the triangle & a bamboo pole is fixed to it to work as handle. A net of 1.0-1.5 cm mesh is fixed to the v. to operate the net; the broad end is pushed along the bottom & then lifted with a jerk to throw fishes towards the handle. This net is used to catch prawns, cat fishes and fry.

13b. Kharrajal (Dhekijal) : This large sized triangular dip net is

constructed as the helajal, but is operated from a stage or platform made of bamboo pieces & implanted in the river bed. The net is operated by fisherman using a bamboo pole as a lever to lower or lift the net.

13c. Bhesaljal or Tongijal : This is similar to the above, but is operated from a boat. The net is fixed to the V shaped bamboo sticks and is allowed to hang like a bag. Prawns & small fishes are easily caught by scooping over the bottom, especially during rainy season.

13d. Khourslajal : This is rectangular in shape 3x2 meter and is suspended from the ends of two curved bamboos carrying each other at right angles. The net is lowered in shallow water near the bank of the river by means of a strong rope & is lifted suddenly when pass over it. It is generally used for catching fresh water mullets.

14. Cash net (Khewalijal) : It is a circular net with the shape of a large umbrella. A strong chord is attached to the apex of the umbrella & a number of lead or iron weight are fixed all along the margin. The fisherman throws the net fully spread over the water keeping the long rope in

this left hand. This has to be done very skillfully so that the net falls on the surface of water fully expanded. The net sinks to the bottom and the circumference closes due to the weights attached to it.

15. Triangular net (Jakoijal) : This is a conical net with a butterfly shape & made up of strings. The mouth of the net is kept open by bamboo sticks fixed like a triangle. One of the sticks is longer to be used as a handle. The fishes enter the reservoir & are collected.

16. Kharkijal : It is rectangular in shape made to tanned cotton. The whole mouth has two flexible bamboo rods, hinged at the two angles & forming upper & lower lips. A vertical bamboo is attached to the middle of the lower lip & passed upward through a ring in the upper lip. The net is suspended from a boat & the mouth kept open by pressure on the bamboo pole. When a fish enters the net, mouth is closed by releasing pressure on the bamboo pole.

17. Drag net (Feryjal, Bachrujal) : These are large sized & they are made in two designs :

17a : The 1st type consists of a bag with two wings & is called

by several names as Peddavala.

17b : The 2nd type is of enormous length the upper margin of which is supported by a strong rope & is provided with nos. of wooden floats. Along the lower margin is the fast rope to which tied a numbers of stone sinkers. One end of the net remain on the bank of the river while a boat carriers the rest of the net to spread it out in the water in a semicircular way, bringing the other extremity of the net, to another point on the river bank. The two ends of the net are then slowly dragged by two parties of fisherman.

18. Gill nets & Entangling nets (Phansijal, Langijal) : These are used to catch the fish by the gills entangling them in the net itself. Different types of nets can be used in a year and may be set in long lines called "fleets". These nets can be set at any depth & can drift or remain fixed to the river bottom. These include gill nets, drifting gill nets, encircling gill nets to trap fish in the circle of net fixed gill net.

RESULT AND DISCUSSION : From the survey, some data regarding the use of different types of fishing gears among the people

were collected. Accordingly, a rough estimation is made about the usage of the different fishing gears by the people living there.

Findings of collected data are as follows : (a) Wounding gears: almost present in every households and use by the fisherman frequently (about 80% in use) (b) Traps: Found in every households mainly used in the paddy fields by both men and women (80%) in use. (c) Line fishing : Commonly used, also taken as a means of entertainment (99%). (d) Fish screens (Fasijal) : Commonly used specially during the floods (80%). (e) Fish trap: Used in the paddy fields mainly by the women especially in the muddy fields and during the rainy seasons (70%). (f) Dingora: not in use mostly used by very few people. (g) Poloh: It is also used in the paddy fields and small drains i.e. muddy drains (60%). (h) Juluki: Commonly used by the people during rainy seasons (40-50%) (i) Thuha: rarely used. (j) Jakoi and khaloi: Almost found in every households used by the masses in the paddy fields and muddy fields where fishes are available.(90%).

Traps for jumping fishes : (a) Lengijal : commonly used for catching fishes. Horizontal net fixed in water or moving boat. (b) (90%).(b)Dip net or lift net (khorajal, pahjal, kahijal or berhijal): they are mainly used in big ponds or rivers by the fisherman. Common in use (about 80% in use).(c)Helajal: this net is commonly used to catch prawns, cat fishes and fry. It is rarely used (about 50-60% in use).(d)Kharrajal: mainly used in big ponds and rivers by 70-80% people.(e) Bhesaljal: (tongijal) used by almost 70-80% people regularly during the rainy season. (f) Khoursaljajal : used by 60-70% people to catch fresh water murels.(g) Cast net (Khewalijal, Reghajal) : Commonly used in ponds and rivers but cannot be used in places full of weeds or with rocky bottom (about 70-80%)(h) Triangular net (jakoi): used in shallow water near river bank (about 40-50% in use)(i)Purse net: these nets are commonly used in river Brahmaputra to catch Hilsa. (60%)(j) Drag net: (feryjal, Bahrujal.): especially used for fishing in big rivers. A lot of men are required for fishing with this kind of net. (About 30-40% in

use).(j) Gill nets and entangling nets (phanijal, lungi jal): almost 70-80% of people used regularly by masses of people in ponds as well as in the rivers.

There are also some restrictions imposed by fishery Department of Assam regarding the use of fishing gears. A short

report : Existing fisher Acts and rules in respect of capture fisheries for augmentation of fish production in the date the Fishery department of Assam imposing restriction on the use of some gears particularly use of prohibited nets during breeding and post breeding seasons. Restriction on the use of nets namely use of Berjal/ Mahajal or Fasijal or any type of net with mesh size of less than 7cm-14cm mesh is prohibited during breeding season i.e. from 1st April to 15th July in every year. The use of net with less than 1cm bar/ 2cm mesh in size is prohibited in any water body throughout the year.

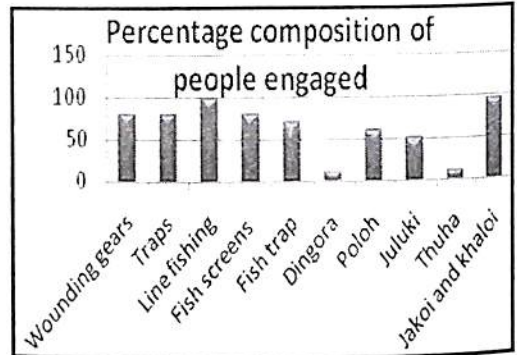
CONCLUSION :

Assam is rich in diverse variety of fish fauna & Fishing is an ancient tradition of Assam. Even nowadays in some places group fishing is done as a

Data collected from the study area :
 Table1. : The data given for different types of fish traps

Gear names	Percentage composition of people engaged
Wounding gears	80
Traps	80
Line fishing	99
Fish screens	80
Fish trap	70
Dingora	10
Poloh	60
Juluki	50
Thuha	10
Jakoi&khaloi	95

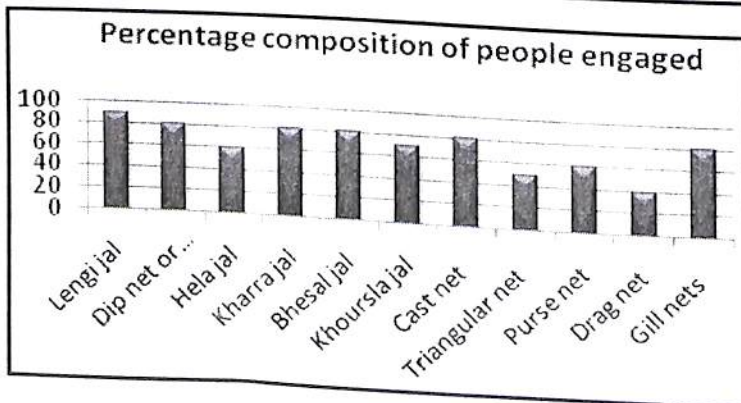
Graph 1 : percentage composition of people using different fish traps



Graph 1 : percentage composition of people using different fish nets

Gear names	Percentage composition of people engaged
Lengijal	90
Dip net or lift net	80
Helajal	60
Kharrajal	80
Bhesaljal	80
Khourslajal	70
Cast net	80
Triangular net	50
Purse net	60
Drag net	40
Gill nets	80

Graph 2: percentage composition of people using different types of fishing nets.



festival. Though most of the fishing gears becoming extinct due to modernization, yet this civilized people use fishing as a means of entertainment, fun as well as hobby. From the study it is seen that though the ancient people were illiterate but they were too intelligent who made different types of fishing gears for catching different fish species. **There is one bad practice in Assam i.e. in every agricultural field of Assam there is at least one pond in each field. During the rainy season these ponds become full. Most of the local fish, air breathing fishes are found available. But after the cultivation is over every villager impound (empty) the pond completely catching all kinds of fishes even the mud-**

bearers. This merciless catching of fishes from the ponds of cultivation field is one of the causes of degradation of fish species. But most surprisingly, it is found that in Kautilya's Artha Sastra entrapping, killing or perturbing of fishes at protected area were treated as punishable offence. Even in Ashoka's Pillar Edict V (246 B.C) Fisheries legislation was inscribed i.e. no fish should be caught on 14th & 15th of the moon and 1st day after full moon during Sravana, Bhadra, Asima and Kartika i.e. from July to November which is the breeding period. So our Govt. should take attention for prohibition of indiscriminate fishing by the local people that affect the species diversity.



STUDY OF SOIL MITES AND DR. ASHIT KR. DATTA

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Mites are minute relatives of spiders and scorpions that belong to the class Arachnida of the Phylum Arthropoda. Mites and Ticks belong to the subclass / order Acari or Acarina. It is said that mites are found 'just about everywhere'. Being the part of almost all terrestrial and aquatic ecosystems mites have considerable ecological and economic significance. Although some mites e.g. Red spider mites have emerged as pests, in fact they are the product ('backfire')

of the application of powerful pesticides developed by mankind. At one time they were not pests living in large numbers within the webs, sucking the plant juices and the damage cause by them was negligible. The widespread application of powerful pesticides killed all their natural enemies resulting in an astronomical increase of these mites. The worse thing is that they become immune to the pesticides and even larger amount had to be used to control them. Their enemies as

were left, if did not succumb immediately to the 'poisons', died from eating 'poisonous' mites.

Soil Mesostigmatid mites make up an important segment of the soil fauna being predacious on small arthropods or scavengers and fungus feeders. They inhabit in the soil, leaf litter and allied habitats play an important role in the terrestrial ecosystems as parts of the food chains (food web). They can also be employed as biological control agents and as biological indicators. Some members of the family Phytoseiidae are beneficial to man as predators of destructive spider mites, Tetranychidae. Other forms are parasitic on insects and other Invertebrates.

Although these minute Arthropods are found in all sorts of odd places and have great diversity of habits, ecological and economic importance they are readily overlooked because of their small (microscopic) size. Little is known of the habits of many mites and new mites are being discovered all the time. There may be more than a million species of mites on the earth. But there are only a handful of scientists studying mites compared with the thousands studying insects.

Dr. Ashit Kumar Datta of Dibrugarh was one of the few

researchers on soil mite in India who did research works on the soil Mesostigmatid mites of the Brahmaputra Valley.

Dr. Ashit Kumar Datta M.Sc.,Ph.D. (1945-2017) was the founder Professor and retired Head of the Department of Zoology of Dibru College, Dibrugarh, Assam. Besides his association and contribution in the literary and cultural fields he was also the Secretary and President of the Dibrugarh Branch of Assam Science Society, (Dibrugarh Science Society).He studied I. Sc. in D.H.S.K. College in 1960. He was one of the first batch students of B.Sc. with Zoology as a subject and one of the eight students who passed B.Sc. in 1965 from D.H.S.K. College with distinction. At that time there was no honours in B.Sc. in the College. The other seven students were- Dolly Borgohain, Urmila Sarma, Nomita Devi, Asotosh Bhattacharjee, Dilip K. Baruah, Amal Krishna Das and Piyush Kanti Banerjee. Dr. Datta was a student of the Department of Zoology, Gauhati University and passed M.Sc. as one of the 4th batch students from the Department (1966-68). During his days in D.H.S.K. College he started writing Bengali short stories. He

won prizes in the various annual literary competitions in the College. In 1960-61 he won 2nd prize in Bengali short story competition. In 1961-62 he won 1st prize in Bengali Essay competition, 1st prize in Bengali Short Story competition and 2nd prize in Bengali poem competition. In the 20th College Week in 1965 (1964-65) he won the first prize in Bengali short story writing competition. Before his admission in the P. G. Classes in Gauhati University, he extended his service as a teacher (Demonstrator) in the Department of Zoology, D.H.S.K. College in 1965.

Dr. Ashit Kumar Datta was one of the three National Experts on Soil Mesostigmata in the nineties. The other two were Dr. S. K. Bhattacharyya of Zoological Survey of India, Calcutta and Dr. Ranjit Kumar Roy of the Department of Zoology, D.H.S.K. College. In the book Animal Resources of India, published by Zoological Survey of India (1991) it is stated "... in the early eighties, A. K. Datta and R. K. Roy, both from Dibrugarh, Assam, were interested to work on soil inhabiting mesostigmatid mites.

Datta (1984) described two new genera, viz. *Forkosclerite* and *Funkotriplotrynum*, three new species and new combinations of three known species from Assam. In the year 1988 Datta added another new genus *Krantzolaspina* from Assam. ... Roy (1988) published reports of his extensive survey of soil mesostigmatid mite of Assam, Arunachal Pradesh, Andhra Pradesh, Delhi, Goa, Karnataka, Kerala, Maharastra, Meghalaya, Nagaland, Orissa, Pondichery, Sikkim, Tamil Nadu, Tripura and West Bengal. The papers included the description of seven new species and ten new records of the mesostigmatid species....".

'A Faunistic Survey of Mesostigmatid Mites (Acari) of Soil, Litter and allied Habitats of the Brahmaputra Valley of Assam' (2014) is the publication of Dr. Ashit Kumar Datta based on his Ph.D. thesis. One of the Examiners of his Ph.D. thesis was Maurice H. Farrier, Professor, Department of Entomology, College of Agricultural and Life Sciences, North Carolina State University, U.S.A. who recommended the thesis for Ph.D. Degree. Through his research

work leading to Ph.D. Degree, Dr. Ashit Kumar Datta recovered, identified and analysed 102 mite species. Among these 4 genera and 30 species are registered as new to science and 37 species were found to be endemic to Assam. The new genera of soil mites described and named by Dr. Ashit Kumar Datta are *Hyattolaspinagen*. nov. (named in the honour of Mr.K.H. Hyatt Curator of British Museum (Natural History), London, U.K. a leading acarologist), *Forkosclerite* Datta 1985 and *Funkotriplotygnium* Datta 1985. The genus of soil mites newly described and named by Dr. Ashit Kumar Datta and Bhattacharjee is *Krantzolaspina* Datta and Bhattacharjee 1988. Dr. Ashit Kumar Datta passed away on the 7th March, 2017. He will always be remembered primarily for his contribution to the field of taxonomy of Soil Mesostigmata in India.

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ENVIRONMENTAL ENGINEERS-THE SPIDERS

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Spiders are wonderful creatures belonging to the class Arachnida of the phylum Arthropoda. Spiders are unique Arachnids as they possess spinnerets to produce silk near the hind area of their abdomen. Another group of Arachnids produce silk by the glands present in their pulp but they are devoid of spinnerets. Spiders produce silk for many purposes like, to protect their young, catch food, make shelters and to move arounds. Spider silk is an elastic, light weight adhesive material with high tensile strength more than that of steel. It is insoluble in water, dilute acids and bases. Spider silk is made of protein like spideroin 1 and spideroin2 etc.

Uses of spider silk :

Spider silk is in high demand for various technological

applications and bears a good economic value. Spiders silk is useful in different engineering technology, advance imaging techniques, production of soft body armour, dress materials etc., ropes, parachute chords, nets etc.,. It was use in optical devices such as telescope, microscope before World War II. In ancient Greece, cobwebs were used as bandage to stop bleeding, Australian aborigines use cobwebs for fishing. The main hindrance of such production is the collection of spider silk; a spider are mostly terrestrials and has cannibalistic nature, hence farming of spider is not successful today, though many naturalists and entrepreneurs tried it since 1709.

Spider silk and biotechnology :

Biotechnologists use the knowledge of spider silk protein

structure and synthesised similar silk protein from genetically modified bacteria, yeast, silk worm moths, goats and plants. The yield of such silk protein from bacteria and yeast is very low. Moreover the proteins synthesised are of unstable character. In 2001, scientists of Germany became successful in producing stable spider silk type protein from tobacco and potato plants. One company, Nexia Biotechnologies Inc. of Montreal, Canada became successful in producing manmade spider silk by genetic engineering in mammalian cells. Suchman made spider silk are used as surgical threads, artificial ligaments and tendons, oxygen permeable contact lenses, in genetic engineering etc, but successful method of spinning is yet to be evolved.

Spider Venom :

Almost all spiders (except the family Uloboridae) bear a pair of venom gland that produce venoms. Venom is used to kill or immobilise their prey and for self-defence. Spider venom is a complex mixture of peptides, proteins and low

molecular weight organic molecules, neurotoxic in nature. Most of the spider venom are not fatal for human being, may cause severe pain, localised swelling, necrosis of tissues and allergic reactions, but may need medical treatment due to secondary infections. Authenticity of the reports of human death due to spider bite is yet to be confirmed.

Spider venom and biotechnology :

Spider venom is emerging as an important area of biotechnological research. It has shown potentiality to be used in agricultural biotechnology by producing bio pesticides as well as in medical biotechnology by innovations of drugs treating cardiac patients.

Conclusion :

Spiders, one of the most diverse groups of organisms are now threatened by several factors like deforestation, expansion of agriculture and grazing area, pollution, urbanization etc. None the less the real extent of the danger is still to be detected as spiders are ignored by conservationist as well as public due to lack of

awareness, public support, fear and hate towards spiders.

Let us start a movement to create awareness about conservation of these environmental engineers.

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ETHNO-MEDICINAL PRACTICES AMONG THE MISHING

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Anthropology is a holistic discipline which deals with the biological and cultural aspects of man. Anthropological studies have revealed that every human community has its own notion regarding health and disease and at the same time methods of coping with them which are referred to as health culture.

Ethno-medicine is an important area which is studied under Medical Anthropology and it brings to light the different traditional medicines used by the simpler societies for their health care practices. It is a set of empirical practices embedded in the knowledge of a social or ethnic group often transmitted orally from generation to generation with the intent to solve health problems.

India is home to numerous population groups with diverse cultures. Hence, the social scientists and other likeminded groups have been taking keen

interest in studying the simpler societies with regard to their ethno-medicinal beliefs and practices.

The present study focuses on the ethno-medicinal practices among the Mishing of Kolakhowa, Dibrugarh.

The People

The Mishing are a Tibeto-Burman language speaking plains scheduled tribe of Assam. Their folk literatures suggest that they migrated down to the plains of Assam in remote past in search of more peaceful and better economic life quite before the advent of the Ahom rule in Assam. Since then the Mishing have been living mostly along the banks of Brahmaputra River and its tributaries for which they are called riverine people.

Subjects and Methods

The present study is conducted in Pani Miri Mishing Gaon at Kolakhowa, Dibrugarh which is approximately 25 km

from Dibrugarh town. The village is more than 100 years old and inhabited by the Mishing people. Informed consent is taken from the respondents prior to collection of data. Case study, interview and observation methods are mainly followed. Information on medicinal plants and indigenous methods of

treatment are mainly collected from local medicine man who prescribes herbal medicines to the villagers. In-depth discussions are held with other elderly persons in the village with ethno-medicinal knowledge. Observation method is mainly followed for identification of the medicinal plants.

Findings

Table 1: Ethno-medicinal practices among the Mishing

Sl. No.	Diseases	Plant scientific name & family	Vernacular name	Method of preparation & treatment
1	Bleeding	<i>Cynodon dactylon</i> (Poaceae)	Duboriban	Bleeding arising from cut can be stopped by applying a paste of <i>C. dactylon</i> , ash and lime stone (Calcium Carbonate).
2	Carbuncle	<i>Alpinia nigra</i> (Zingiberaceae), <i>Croton tiglium</i> (Euphorbiaceae), <i>Euphorbia antiquorum</i> (Euphorbiaceae)	Tora, Onibih, Hiju	Fruits of <i>A. nigra</i> and <i>C. tiglium</i> are crushed and 1 drop of <i>E. antiquorum</i> is added to it to be applied as a paste on the affected portion.
3	Cough	<i>Ocimum sanctum</i> (Lamiaceae)	Tulasi	Leaves are crushed to extract juice. It is mixed with honey and taken orally.
4	Diarrhoea	<i>Alstonia scholaris</i> (Apocynaceae), <i>Sida cordifolia</i> (Malvaceae), <i>Croton joufra</i> (Euphorbiaceae)	Chationa, Sunborial, Gos maudi	Bark of <i>A. scholaris</i> and <i>C. joufra</i> along with roots of <i>S. cordifolia</i> are crushed and then boiled in water to be taken orally. It is also given to pregnant women in their advanced stage. Dose - ½ cup.
5	Eczema	<i>Mimosa pudica</i> (Mimosaceae)	Yuptap	Leaves and stem of <i>M. pudica</i> is finely crushed and applied as a paste on the affected part and tied with a cloth or leaves. After 24 hours the affected part is washed with lukewarm water.
6	Gastritis	<i>Centella asiatica</i> (Apiaceae)	Manimuni	Juice of <i>C. asiatica</i> is taken orally after boiling.
7	High blood pressure	<i>Clerodendrum colebrookianum</i> (Verbanaceae)	Nephapu	Leaves of <i>C. colebrookianum</i> are used to prepare curry. It keeps high blood pressure under control.

8	Jaundice	<i>Costus speciosus</i> (Costaceae)	Zomlakhuti	Potato like roots of <i>C. speciosus</i> is crushed and mixed with milk and taken for 2 - 3 days.
9	Malaria	<i>Alstonia scholaris</i> (Apocynaceae)	Chationa	Bark of <i>A. scholaris</i> is crushed and boiled in water. It is taken in empty stomach preferably in the morning. Dose - ½ cup.
10	Menstrual Pain	<i>Acorus calamus</i> (Araceae), <i>Houttuynia cordata</i> (Saururaceae)	Bos, Masanduri	Roots of <i>A. calamus</i> and 9 tender leaves of <i>H. cordata</i> are crushed and taken empty stomach for 2 days
11	Pain, body ache	<i>Vitex negundo</i> (Verbanaceae)	Posotia	Leaves are crushed and applied as a paste on the pain area. A bath with crushed leaves in the water gives relief from stress and body ache.
12	Pneumonia	<i>Piper nigrum</i> (Piperaceae) <i>Piper betle</i> (Piperaceae)	Jaluk, Aoni pan	<i>P. nigrum</i> and bark of <i>P. betle</i> are crushed, properly mixed and taken for 3 days.
13	Snake bite	<i>Nerium indicum</i> (Apocynaceae)	Boga korobi	Root of <i>N. indicum</i> is crushed and applied over the wound and few drops is given inside the mouth.
14	Toothache	<i>Xanthoxylum nitidum</i> (Rutaceae)	Lata tezmui	Bark of <i>X. nitidum</i> is crushed and the juice is rubbed on the affected teeth. It can also be massaged through out the gums.
15	Vomiting	<i>Citrus aurantifolia</i> (Rutaceae)	Tasuk	Juice of <i>C. aurantifolia</i> is taken orally to stop vomiting.

Conclusion

Studies on ethno-medicine reveals how different culture use different medicinal plants as natural remedy for different diseases. This in itself bears testimony to the fact how natural environment plays a major role in the lives of the people. Present piece of work shows that herbal medicines are in practice among the Mishing people of Pani Miri Gaon. However, it is also found that the concept of

traditional medicine is getting diluted especially among the new generation.

Acknowledgement

The author wishes to thank the respondents with all sincerity who took part in the present study and also for their valuable information.

Declaration

This study is purely academic in nature and in no way intrude the domain of intellectual property rights of the indigenous people.

BIOFUELS -A HOPE FOR FUTURE

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Biofuels are the transport fuels, which differ from fossil transport fuels in that they are derived from renewable biomass, including crops and a variety of waste materials. They are environment friendly, producing much less amount of green house gases and can be integrated with fossil fuels like petrol(gasoline). Biofuels can be broadly classified into (i) First generation biofuels(raw materials generally used as food): these include bioethanol used as a substitute for petrol, and biodiesel used as a substitute for diesel. Bioethanol is extracted from cereal based crops - mainly wheat in the UK, and maize (corn), soybean and sugarcane in the US and South America. Biodiesel on the hand, is extracted from oilseed based crops such as oilseed rape in the UK, and palm-oil in the South East Asia. (ii) Second generation

biofuels(raw materials is non food resources; e.g. switchgrass and Miscanthus). These include bioethanol, used as substitute for petrol, derived from cellulose, and biogas, used as a substitute for natural gas) derived from organic waste materials.

Ethanol produced from sugarcane in Brazil is often given as an example of a good biofuels. In contrast, the worst performing biofuels deliver significantly less energy, and contribute to greenhouse gas emissions. The increased emissions tend to be indirect, for example, through forest fires and clearing to make way for plantations. Biodiesel produced from palm-oil in Indonesia is often cited as an example of bad biofuel.

The feedstocks of first generation biofuels are also used in food production, and it is

estimated that the grain required to produce a petrol tank full of ethanol for a large car would be sufficient to feed one person per year. Therefore , use of food crops for biofuels in the short term may lead to higher food prices, and in the long term may

contribute to food shortages. Several countries, therefore , are revising their plans of mandatory blending requirements and subsidies for biofuels, so that the use of food crops for biofuel production may come down.



AQUAPONICS - THE FUTURE OF SUSTAINABLE FARMING

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In the recent past, emphasis was on the practice of organic farming. Non GM, chemical free and naturally grown food was given much priority. However, more recently, the organic trend has moved aside and made way for sustainable farming. Sustainable farming is a system where along with the production of food, fibre or other plant or animal products, other factors such as protection of the environment, public health, human communities and animal welfare are also taken care of. One such example of sustainable farming is Aquaponics.

Aquaponics is a relatively new approach to farming which involves the amalgamation of two separate techniques. It is an integration of aquaculture (raising fish) and hydroponics (the soil-less growing of plants) where fishes and plants grow

together in a mutually beneficial cycle and aims at fulfilling the ever-increasing demand of organic fruits and vegetables. In other words it is the symbiotic cultivation of plants and aquatic animals in a recirculating environment. In aquaponics, the waste produced by farmed fishes and other aquatic creatures such as snails, crayfish or prawns provides nutrients for plants grown hydroponically in specially designed beds in a symbiotic environment.

An aquaponic system thrives because of three main components: Fishes, Plants and Bacteria. The concept behind the process is that a source of food is fed to the fish in the tank; effluents build up including ammonia which is pumped into a bed of stones containing bacterium which converts ammonia from the fish effluents

into nitrates via nitrification. These nitrates aid plant growth on a medium such as gravel or clay pebbles. The water then filters back into the fish tank where the cycle begins again. There is substantial promise and benefits to be gained from the aquaponics theory. In this co ordinate system, the fish waste water is passed through several storage tank facilities where the complex nitrogenous fish waste are broken down into simpler forms such as nitrates and nitrites by a powerful army of micro organism making them finally available to plant as important nutrients helping plant growth. As the plants suck up these nutrients, they purify the water. After being used by the plants, the naturally recycled clean water is again returned for re use in the fish tanks as a continuous sustainable production system. This is an easy and useful way of supplying nutrients to the plants and fresh water to aquatic animals. Bacteria are a crucial aspect of aquaponics serving as the bridge that connects the fish water to the plant fertilizers. This biological engine removes toxic wastes by transforming them into accessible plant nutrients.

It is argued that aquaponics is a much more sustainable system than traditional agriculture. It can also be argued that the system is more efficient than hydroponics and aquaculture. Both aquaculture and hydroponics have their limitations.

Traditional hydroponic systems rely on the careful application of expensive, man-made nutrients made from mixing together a concoction of chemicals, salts and trace elements. The strength of this mixture needs to be carefully monitored, along with pH, using expensive meters. Water in hydroponic systems needs to be discharged periodically, as the salts and chemicals build up in the water becomes toxic to the plants. This is both inconvenient and problematic as the disposal location of this waste water needs to be carefully considered.

In aquaculture the tank water becomes polluted with fish effluent which gives off high concentrations of ammonia. Water has to be discharged at a rate of 10-20% of the total volume in the tank daily. This uses a tremendous amount of water and

the discharged water is often pumped into open streams where it pollutes and destroys waterways.

These can be avoided in aquaponics. In this system the need to add expensive nutrients to the water does not arise. The fishes are fed with inexpensive fish feed and food scrap. Careful monitoring of the system needs to be done only during the first month until the system is established properly. Water is neither discarded nor replaced. Water only needs to be topped up as it evaporates. This saves a large amount of water and is also environment friendly as it reuses resources currently considered "waste". Moreover, there is no more toxic run-off as in hydroponics or aquaculture. Aquaponics uses only 1/10th of the water of soil-based gardening, and even less water than hydroponics or recirculating aquaculture. Therefore it can be argued that aquaponics is a vastly superior form of agriculture in terms of sustainability.

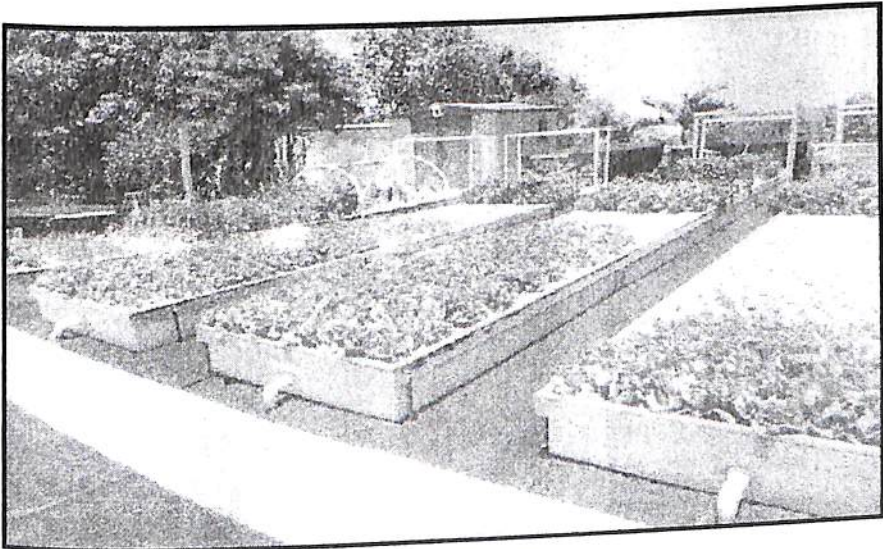
In the present times, aquaponics has moved from the realm of experimentation to

commercial level. One very successful and well known combination of fish-plant multi-tropic production system that has been very well-established include the fish belonging to the genera *Tilapia*, *Oreochromis* and *Sarotherodon* production with different Asteraceae (lettuce), Solanaceae (different species of capsicum, tomato, egg plant) and Cucurbitaceae (squash, gourd, zucchini, cucumber etc.). Recently ornamental fish production under artificial or controlled condition and under natural environment condition has also been integrated with aquaculture practices. The only limitation of this farming technique is that one cannot grow underground fruits and vegetables.

A rising population, particularly in urbanised areas with limited space means that the versatility of the process is extremely valuable. This method of urban farming can be practised where enough land is not available and a section of educated people are present who value and understand both health and environment. It can prove to be a great way for city

dwellers to grow a meaningful portion of the food they eat. Aquaponics is an efficient answer to the most basic requirement of modern living: a clean and sustainable source of food. Thus,

it can be concluded that the practice of aquaponics can be a solution to several environmental and agricultural problems. It has the potential to revolutionize the agricultural scenario.



OPEN CAST MINING AND ENVIRONMENTAL DEGRADATION

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Mining word comes from a Latin word 'minerale' is from minera. In general mineralogy indicates about the ore extracted from the earth. Anything mined, like minerals, are "from" the earth. Mining is a very old concept and human civilization is associated with mining from remote past either for personal needs (Gold, Diamond) or national needs (Metals supporting heavy industries; Coal provide energy needs and requirements) etc. among 213 countries, 160 countries reportedly have the mining industry as a significant contributor to the economy and majority of them are unfortunately open cast mining.

Mining are of four main types, i.e. - Open cast or surfacemining, Underground mining, In situ mining and placer mining of which open cast or surface mining is regarded as the most easy and

common one but also the most devastating and harmful one. All kinds of mining contain following phases-

- **Exploration** : Extensive searching and research is done for utility and richness of the mine.
- **Extraction** : Removing metal bearing minerals, separation of useful minerals from remaining matter done by smelting.
- **Mine closure** : Reclaiming disturbed areas and restoration of previous environment.

Open cast mining is done when commercially useful minerals are available near the surface of the earth. These mines are typically enlarged until the mineral resource is exhausted or an increasing ratio of overburden to ore makes further mining uneconomic. After the mine is exhausted the land fill method

is used by garbage deposition and then land rehabilitation is done by adopting proper measures. In all over the world along with India most commonly practiced open cast mining is coal. It was the starter cause of Industrial Revolution of the 19th and 20th centuries.

Effects of open cast mining :

- 1) Deforestation - large scale deforestation is inevitable in open cast mining whether it is practiced in valleys or in mountain tops.
- 2) Erosion - erosion results due to removal of top soil and unstable surface soil condition.
- 3) Dumping of discards - dumping off of mine remains and discards in the nearby area also cause a serious problem similar to mines itself. It cause harm to flora and fauna and as a whole the entire environment.
- 4) Acid mine drainage - chemicals obtained from mines contaminates the ground water system and nearby surface waters.
- 5) Loss of biodiversity - removal of top soil and vegetation lead to decline

in flora, fauna and promoting land degradation.

- 6) Air pollution - Methane gas is a common source of ignition of explosions in coal mines and others and can result in violent coal dust explosions. Particulates, dust and SOx result in air pollution.
- 7) Occupational hazards - Loss of eyesight and problems in vision is often observed among people working in stone crushing, and coal fields etc.

Existing remedies :

Some laws are already present in India regarding open cast mining and some other laws though not strictly aimed in this but then also have provisions and regulations in this respect. Some of them includes- Mines and Minerals (Development and Regulation) Act (1948), Forest Conservation Act (1980), Environment Protection Act (1986), National Mineral Policy (NMP, 2008) based on The Hoda Committee report etc. But the main cause of extend of degradation due to mining is because of less concern about its closure, usually proper procedure is not maintained during this process and hence the threat of damage become rigorous.

কাৰবি লোকসাহিত্যত প্ৰকৃতি

অনন্ত টেৰণ
মুৰব্বী অধ্যাপক, অসমীয়া বিভাগ

অসমৰ প্ৰাচীনতম অধিবাসীসকলৰ ভিতৰত কাৰবিসকল অন্যতম। অসমলৈ প্ৰথমে কাৰবিসকলেই আগমন কৰিছিল বুলি বহুতে ক'ব খোজে। সাংস্কৃতিকভাৱে কাৰবিসকল পাহাৰীয়া জাতি। প্ৰাকৃতিক পৰিবেশৰ মাজত বাস কৰি ভাল পোৱা এইসকল লোক প্ৰকৃতি প্ৰেমী। এই জাতিটোৰ লোকজীৱন প্ৰকৃতিৰ ওপৰত কেন্দ্ৰ কৰি গঢ়ি উঠিছে। প্ৰকৃতিক কেন্দ্ৰ কৰিয়েই তেওঁলোকৰ সংস্কৃতিৰ বিকাশ ঘটিছে। সেইহে প্ৰতিটো ক্ষেত্ৰতে প্ৰকৃতিৰ সৈতে কাৰবিসকলৰ সম্বন্ধ অতি নিবিড়।

কাৰবি লোকসাহিত্যত প্ৰকৃতিক কেনেদৰে গুৰুত্ব প্ৰদান কৰিছে সেই বিষয়ে 'কাৰবি কে'প্লাং' গীতত তাৰ আভাস পোৱা যায়। গীতত এই বিষয়ে এনেদৰে উল্লেখ পোৱা যায় —

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আচেং থেংপি পেন্ থেংফাং। আনছি ছিম্ তেপ্পি ফেলাং।
থিয়ক্ ফাকলেং স্ৰজন তাং। চক্ কইল' লাৰিত্ লাচায় আন।।
ফিজু কাৰলে' স্ৰজন ফাং। স্ৰজন ছিম্ ৰ'তৈক্ ৰ'জাং।।

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ইক চিজাদি আলাম্। পিন্চং পিন্থি চক্চে' লাং।

রাংথু ছপিথে' আদাং। আছেং চিজাদি আলাম্ কাৰবি স্ৰজন নাংজিলাং।।”
(আৰণ আতেং, বংলং তেৰাং, পৃ. ১০৩ - ১০৪, ১৯৮০)

অসমীয়া ভাৱাৰ্থ : আদিত এই পৃথিৱী নাছিল। সৃষ্টিকৰ্তা ব্ৰহ্মাই এই ভূখণ্ড সৃষ্টি কৰি প্ৰথমে গছ-গছনি, খেৰ, বন, হৰিণ, গাহৰি, নিগনি, কেৰ্কেটুৱা আদি স্ৰজন কৰিলে। তাৰ পিছত স্বৰ্গলৈ গমন কৰিলে। কিন্তু, স্বৰ্গ গৈ পোৱাৰ পিছত তেওঁ ভাবিলে পৃথিৱীত এই বিশাল সৃষ্টি কোনে চোৱা-চিতা কৰিব? সৃষ্টি কাৰ্য সম্পূৰ্ণ হোৱা নাই বুলি সৃষ্টিকৰ্তা পৃথিৱীলৈ নামি আহিল আৰু 'কাৰবি' অৰ্থাৎ মানুহ স্ৰজন কৰিলে।

পৃথিবীত আদিম মানৱ জাতিয়ে ক্ষুধা নিবাৰণৰ বাবে বিভিন্ন গছৰ পাত, শিপা, ফল-মূল, আদি ভক্ষণ কৰিছিল। এক কথাত মানৱ জাতিয়ো ইতৰ প্ৰাণীবিলাকৰ দৰেই জীৱন যাপন কৰিছিল। কাৰবি লোকগীতত এনে ছবিৰ প্ৰতিফলন এইদৰে দেখা যায় —

“পিব্থে’ কাংদুক্ আক’লাং । কাথি ৱাংৱে’ আক’লাং ॥

লংলে’ আংকৰ্ পাচ’বান্ । ছিনিং আংকৰ্ জিব্হাম্ ॥

লাছি পাচ’বান্ জব্লাং । ॥”

(বংলং তেবাং, —‘লখী কেপ্পাং আলুন’, আৰণ আতেং; পৃ. ১০৬)

অসমীয়া ভাৱাৰ্থ : যেতিয়া জগতখন চালুকীয়া অৱস্থাত আছিল, তেতিয়া মানুহে মাটিৰ তলত থকা গছ-লতাৰ শিপা, গছৰ ডালত ওলমি থকা ফল-মূল, পাত আদি ভক্ষণ কৰি ক্ষুধা নিবাৰণ কৰিছিল আৰু তাৰ পৰাই ‘জবলাং’ (সুৰা) তৈয়াৰ কৰি লৈছিল।

মানৱ জাতিয়ে কৃষিজীৱী জীৱন আৰম্ভ কৰি যযাৱৰী জীৱনৰ অন্ত পেলালে। মানৱ সভ্যতাৰ বিকাশত কৃষিজীৱী জীৱনে আমোল পৰিবৰ্তন সাধন কৰিলে আৰু স্থায়ীভাৱে বসবাস কৰিবলৈ বাধ্য কৰোৱালে। এইটো ঠিক যে কৃষি সভ্যতা পৃথিবীৰ সকলো ঠাইতে একে সময়তে বিকাশ লাভ কৰা নাছিল। কাৰবিসকলৰ মাজত কৃষিজীৱী জীৱন যাত্ৰাৰ পাতনি মেলাৰ আগতে খাদ্য অন্বেষণৰ ক্ষেত্ৰত তেওঁলোকে সম্পূৰ্ণৰূপে প্ৰকৃতিৰ ওপৰত নিৰ্ভৰশীল আছিল। আলু, কচু, বিভিন্ন ফল-মূল আদিয়েই কাৰবিসকলৰ প্ৰধান খাদ্য আছিল। কিন্তু, অন্য জনগোষ্ঠীৰ সংস্পৰ্শলৈ অহাৰ পিছতহে তেওঁলোকে যে ধানৰ খেতি কৰিবলৈ শিকিলে এই বিষয়ে চহা কবিয়ে বচনা কৰি থৈ যোৱা লোকগীতত এনেদৰে পোৱা যায় —

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নে’তা পুথেক্থে’ লন’জাং । তেবন্ বংছ’প’ লন’জাং ॥

আন’ছি বন্মে’ ফাক’ইজাং । তেবন্ বংছ’প’ আজাং ॥

কাথি বন্ নাংল’ ইৱান্ । কাথি চ’ কিন্তিন্ লাংলাং ॥

কিন্তিন্ আছেংৱে’ কাংছাম্ আন’ছি পেংজা আনিংহাং ॥ ”

(বংলং তেবাং, —‘লখী কেপ্পাং আলুন’, আৰণ আতেং,

পৃ. ১১২ - ১১৩, ১৯৮০)

অসমীয়া ভাৱাৰ্থ : অচিনাকী গুটিবিলাকৰ বিষয়ে সোধাত মাছমৰীয়াজনে নাজনো বুলি সম্বিধান দি তেবন্ বংছ’প’ক এঠোপা ধান তুলি দিলে। তেবন্ বংছ’প’ই ঘৰলৈ আহি

অলপ ধান সিজাই খালে। ধানৰ সোৱাদ ভালপাই মানুহৰ বাবে ইয়েই উত্তম খাদ্য বুলি ভাবিলে। তাৰ পিছত পেংজা গাঁৱৰ পূব ফালে ধানৰ গুটিবোৰ সিঁচি ধান খেতিৰ শুভাৰম্ভ কৰিলে।

সকলো জাতি-জনগোষ্ঠীৰ সাংস্কৃতিক জীৱনত প্ৰাকৃতিক সম্পদৰ ব্যৱহাৰ পোৱা যায়। আমপাত, বেলপাত, বিভিন্ন ফুল, কলপাত আদিৰ ব্যৱহাৰ এই ক্ষেত্ৰত উল্লেখযোগ্য উপাদান হিছাপে ব্যৱহাৰ হৈ আহিছে। এই উপচাৰসমূহৰ ব্যৱহাৰে প্ৰকৃতিৰ ওপৰত মানুহৰ নিৰ্ভৰশীলতাকে সূচায়। কাৰবিসকলৰ সামাজিক তথা সাংস্কৃতিক জীৱনত 'বং' অৰ্থাৎ তিতা লাউৰ ব্যৱহাৰ অতি গুৰুত্বপূৰ্ণ। এই বিষয়ে লোকসাহিত্যত এনেদৰে পোৱা যায় —

“ছংছাৰ্ বাৰিথে’। আজাং আছেৰ্মে’।।

মুছ’ জিৰ্কে’ ক্লে’। তইল’ পিৰ্থে’।।

ইপুম্ বংচিন্ মে’। ইপুম্ বংদাম্ মে’।।

ছমিন্দাৰ্ নং নে’। নাং মিৰিং বং ছাৰ্থে’।।

নাং দাম্ছাৰ্ লে’ ব’চে’। বংচিন্ বং কামে’।।”

(বসন্ত দাস, কাৰবি সংস্কৃতিৰ ইতিহাস, পৃ. ৫৫, ২০১০)

(অসমীয়া ভাৱাৰ্থ : তোমালোকৰ লগত কোনো পাত্ৰ নথকা দেখি পুতৌ লাগিল, মই পৃথিৱীলৈ দুটা তিতালাওৰ পাত্ৰ পঠিয়ালোঁ, এটাৰ নাম বংচিন্, আনটোৰ নাম বংদাম্। এই পাত্ৰ দুটাৰে তোমালোকে বিয়া আৰু সকামত লাওপানী ৰাখিবা।)

কাৰবিসকলৰ ধৰ্মীয় বিশ্বাস মূলতঃ প্ৰকৃতি কেন্দ্ৰিক। সেইবাবে বৰ্তমান কালতো নদ-নদী, পৰ্বত-পাহাৰ আদিক স্থানীয় দেৱ-দেৱী বুলি বিশ্বাস কৰি পূজা কৰে। কাৰবি যোজনাত কোৱা হয় — ‘তেপ্পং ইছি মুৰ্তি এদন, থেংপি এবং আব্‌নাম্ ইনুত’ — অৰ্থাৎ হাফলুই প্ৰতি ভূত-প্ৰেত, গছে প্ৰতি দেৱতা। এই বিশ্বাসৰ ভিত্তিত কিছুমান লোকদেৱতা পোৱা যায়। এই লোকদেৱতাসকলক ‘থেংপি-থেংছ’ বুলি কোৱা হয়। থেংপি-থেংছ’ মানে বনৰ দেৱতা। এনে দেৱতা কেইজনমান হ’ল — হাবিত আছে’ (অৰণ্যৰ পিশাচ), পিৰদা (বনজুইৰ দেৱতা), দৰ-থেলেন্ (সাপৰ দেৱতা), লাংহে’ লাংৰই আংলং (ঘাটৰ দেৱতা), লাং আচে কামা (জলদেৱতা), ইংলিং আচে কামা (পাহাৰৰ দেৱতা) ইত্যাদি। সেয়ে কোনো শুভকৰ্মলৈ আগবাঢ়িলে স্থানীয় দেৱ-দেৱীৰ সন্তুষ্টিৰ অৰ্থে অন্ততঃ তামোল-পাণ এযোৰ আগবঢ়োৱা নিয়ম এতিয়াও পালন কৰা হয়। কাৰবি পঞ্জিকা অনুসৰি নতুন বছৰত সকলোৰে সুখ-সমৃদ্ধি কামনা কৰি যি ‘বংকেৰ’

পূজা পালন কৰা হয়, সেই পূজাতো স্থানীয় নদ-নদী, পৰ্বত-পাহাৰ আদিক উদ্দেশ্যিও শৰাই আগবঢ়োৱা হয়। বংকোৰ পূজাত মূলতঃ হে'মফু, মুক্ৰাং আৰু বাছিন্জা দেৱীৰ নামত উদ্দেশ্যি থাপনা পতা হয়। সেয়ে হ'লেও মূলতঃ এই পূজা প্ৰকৃতিক সন্তুষ্ট কৰাৰ উদ্দেশ্যে অনুষ্ঠিত কৰা ধৰ্মীয় অনুষ্ঠান।

গতিকে, ধৰ্মীয় দিশত কাৰবিসকল প্ৰকৃতিৰ ওপৰত নিৰ্ভৰশীল এটা জাতি। ধৰ্মীয় অনুষ্ঠানৰ প্ৰতিটো খোজতে প্ৰকৃতিৰ ওপৰত নিৰ্ভৰশীল হোৱা এই জনগোষ্ঠীৰ এটা এৰাব নোৱৰা দিশ। পূজাৰ বাবে প্ৰয়োজনীয় নৈবেদ্যসমূহো প্ৰকৃতিৰ পৰাই সংগ্ৰহ কৰা হয়। কলপাত, নোৱৰা দিশ। পূজাৰ বাবে প্ৰয়োজনীয় নৈবেদ্যসমূহো প্ৰকৃতিৰ পৰাই সংগ্ৰহ কৰা হয়। কলপাত, বাঁহ আৰু তাৰ পাত, ফংৰং (শিঙৰি গছ), ছুৱে গছৰ পাত (কাঁইটীয়া আৰু তেঁতেলী পাতৰ দৰে কিন্তু লতাজাতীয় এবিধ গছ), তৰা পাত, ইংৰি (এবিধ বিশেষ বন, হাৰ কটা বন), তিবং (ডাঙৰ জাতৰ ইকৰা), বেত, দুবৰিবন, খেৰ ইত্যাদি পূজাৰ উপকৰণ হিচাপে ব্যৱহাৰ কৰা হয়। তদুপৰি বলি-বিধানত বিশ্বাসী কাৰবিসকলে কণী, কুকুৰা, ছাগলী, গাহৰি আদি পূজাত উচৰ্গা কৰে। পূজাৰ নৈবেদ্যৰ বাবে কাৰবিসকলে হাবিৰ পৰা মে'হে'ক, হান্থু, হেছ' (তিতা ভেঁকুৰী), হেন্ৰু (বনৰীয়া কচু), দুংকে'ক (টেঁকীয়া), লাংদুং (কলডিল) আদি গোটায়। কাৰবিসকলৰ বিভিন্ন গীত-পদ আৰু মন্ত্ৰসমূহত এই বিষয়ে উল্লেখ পোৱা যায়।

টোটেম বিশ্বাস পৃথিৱীৰ প্ৰায় সকলো জাতি-জনগোষ্ঠীৰ মাজত পোৱা যায়। এই টোটেম প্ৰকৃতিৰ সৈতে সম্পৰ্কিত এটা প্ৰকৃতিকেন্দ্ৰিক ধৰ্মীয় বিশ্বাস। কাৰবিসকলো এই বিশ্বাসৰ দ্বাৰা সামাজিক তথা পাৰিবাৰিক সম্বন্ধ নিৰ্ণয় কৰা ৰীতি মানি চলে। কাৰবিসকলৰ মাজত গোত্ৰ অনুসৰি টোটেমৰ যি বিশ্বাস সেই সম্পৰ্কে অনেক সাধুকথা পোৱা যায়। উদাহৰণস্বৰূপে তেৰাং গোত্ৰৰ বিষয়ে প্ৰচলিত দুটা কাহিনী এনেদৰে পোৱা যায় — এসময়ত তেৰাং গোত্ৰৰ দুজন ককাই-ভাই আছিল। ককায়েকে ভায়েকক ষড়যন্ত্ৰ কৰি মাৰি পেলাবলৈ সদায়েই চেষ্টা কৰি থাকে। কিন্তু, কিবা প্ৰকাৰে প্ৰতিবাৰে মৃত্যু মুখৰ পৰা ঘূৰি আহে। ভায়েকে সকলো কথা পাহৰি ককায়েকৰ লগত থাকিবলৈ লয়। এদিন ককায়েকে মাছ মাৰিবলৈ ফুচলাই ভায়েকক লৈ গ'ল। সেইদিনাও ককায়েকে ছেগ বুজি কোবাল সোঁতত বৈ থকা জুৰিত ঠেলি পেলাই থৈ ঘৰলৈ গ'ল। ভায়েকে কোনো মতে নদীৰ পাৰত গজা একোটা 'হানজাং চিক্লি' (নদীৰ কাষত গজা এবিধ বনশাক) —ৰ গছত খামুচি ধৰি প্ৰাণ ৰক্ষা পালে। সেই বনশাকৰ কাৰণে জীৱনটো ৰক্ষা পালে বুলি 'হানজাং চিক্লি'ক উদ্দেশ্যি তেওঁ ক'লে — “এই সংসাৰ থাকে মানে আমি ককাই-ভাই হ'লোঁ। আজিৰে পৰা এই গোত্ৰৰ কোনোৱে 'হানজাং চিক্লি' শাক নাখাওঁ বুলি শপত খালোঁ; কোনোৱে যদি এই নিষেধাজ্ঞা নামানে তেতিয়া হ'লে তোমাক হাত দিয়াৰ লগে লগেই সেইজনৰ হাত চিগি যাব”। সেই দিনাৰ পৰাই তেৰাং গোত্ৰৰ লোকে এই শাক নাখায়

আৰু 'হান্‌জাং' নামেৰে এই গোত্ৰ পৰিচিত হ'ল। আন এটা কাহিনী মতে 'ৰ'তেৰাং' অৰ্থাৎ ধনেশপখীয়ে ভায়েকৰ জীৱন ৰক্ষা কৰিছিল বাবে পিছলৈ মূল গোত্ৰটো 'তেৰাং' গোত্ৰ বুলি জনাজাত হ'ল।

গতিকে, প্ৰকৃতিৰ সৈতে কাৰবিসকলৰ সম্পৰ্ক যে অতি গভীৰ সেই কথা তেওঁলোকৰ গোত্ৰৰ সৈতে সম্পৰ্কিত টোটেম বিশ্বাসৰ পৰা অনুমান কৰিব পাৰি। তলত গোত্ৰ অনুসৰি টোটেমৰ তালিকা দিয়া হাল;

মূল গোত্ৰ	কাব্যিক উপাধি	টোটেম
তেৰাং	হান্‌জাং	ৰ'তে'ৰাং (ধনেশপক্ষী)
তিমুং	তুংজাং / তুংএ'	ৰ'মু ম্প' (ঈগল)
তেবন্	ত্ৰন্‌জাং	ল'ত্ৰন্‌ গছ (গন্ধসৰৈ গছ)
ইংহি	এ'জাং	আৰ্‌হি গছ (ব্ৰজনলি গছ)
ইংতি	লিজাং	ইংছুম্ গছ (আবু টেঙা গছ)

কাৰবিসকলৰ জীৱন যাপন পদ্ধতি প্ৰকৃতিৰ লগত ইমান নিবিড়ভাৱে জৰিত হৈ আছে যে গীত-মাত আদিতো তাৰ স্পষ্ট প্ৰভাৱ দেখিবলৈ পোৱা যায়। সচৰাচৰ আধুনিক কবিতাতহে দেখা পোৱা প্ৰতীকৰ ব্যৱহাৰ কাৰবি লোকসাহিত্যত নিজস্ব ৰীতি আৰু বৈশিষ্ট্যৰে আত্মপ্ৰকাশ ঘটিছে তাহানিৰ অনাস্কৰী চহা কবিসকলৰ দ্বাৰা ৰচিত বিভিন্ন গীত-মাত তথা কাব্যসমূহত। কাৰবি লোকসাহিত্যত ব্যৱহাৰ হোৱা এনে প্ৰতীকসমূহ সৰ্বজন স্বীকৃত ৰূপত পোৱা যায়। এইখিনিতে মন কৰিবলগীয়া যে কিছুমান প্ৰতীকৰ দ্বৈত অৰ্থ প্ৰকাশক গুণেৰে সমৃদ্ধ; যি সমূহে কাব্যিক ভাষাত এটা অৰ্থ আৰু লৌকিক ভাষাত অইন এটা অৰ্থ প্ৰকাশ কৰে। তাৰে অনেক প্ৰতীক আকৌ প্ৰাকৃতিক জগতখনৰ পৰা গ্ৰহণ কৰা। তলত কাৰবি গীত-মাতত ব্যৱহৃত এনে কেইটিমান প্ৰতীকৰ উদাহৰণ দাঙি ধৰা হ'ল।

প্ৰতীক	প্ৰতীকি অৰ্থ	লৌকিক অৰ্থ
ছাংমান্	পতি	মকৰা
তাৰ্‌মে'	সহোদৰ, ককাই-ভাই	চোৰাত গছ আৰু তাৰ পাত
তৰ্‌তে'	ৰাজবিষয়া	কৰদৈ টেঙা
থে'পাক্	জোঁৰাই	উৰহী

থে'লু	শহৰ	আমলখি
হান্‌জাং	তেবাং ফৈদ	সৰিয়হ
ৰ'লেং	জীৱন	বাঢ়ৈটোকা চৰাই
ৰ'হাম্	মানুহ, পথিক	কুকুহা চৰাই ইত্যাদি।

ফকৰা-যোজনা : ক)

আৰে' তাংতে' চে'হে'তা অক্।

(নাথকিলে কেঁকুৰাই মাছ। তুল. নাই মোমাইতকৈ কণা মোমাই ভাল।)

খ) ইংনাৰ্ আছাব্‌বুৰা ত'ৰাৰ্ মাংহ্‌হে'

ম'নিত্ কে'ছাৰ্ বিছাৰ্ মাংহ্‌হে'।

(বুঢ়া হাতীয়ে বাট নেহেৰুৱাই, বৃদ্ধলোকে বিবুদ্ধিত নপৰে।

তুল. সোণাৰীয়ে সোণ চিনে, বৰাই চিনে কঁচু। কথা চহকীয়ে কথা চিনে, হাঁহে চিনে কেঁচু।)

গ)

আকেং লক্‌পেত্‌ছিতা ৰজাৰ্ আছ'। (ঠেং ভগা হ'লেও
ভীমৰাজ পক্ষী। তুল. ভালেই হওক বেয়াই হওক ভূঞাৰ
পোৱালী। ফটা হওক ছিটা হওক পাটৰ টঙালী।।)

সাঁথৰ :

আজ' আজ' ৰ'লংকম্ কে'কান্, পিল? চিজাৰ্।

(ৰাতি ৰাতি বগলীৰ নাচ, কি? বিচনী।

তুল. এক ঠেঙিয়া বগলী নাচে গধূলি।)

গ্ৰন্থপঞ্জী :

ক্ৰ', বিদৰছিং সম্পা. : জুতাংআমুং, কাৰবি লামেত্ আমেই, ৰং থে'-আং, ডিফু, ১৯৯৮

তেবাং, বংলং : আৰণ আতেং, পূৰ্বশ্ৰী পিণ্টাৰ্ছ, যোৰহাট, ১৯৮০

দাস, বসন্ত : কাৰবি সংস্কৃতিৰ ইতিহাস, সম্পা. অজিত ছিংনাৰ, আঁক-বাক,
গুৱাহাটী, ২০১০

বৰ্মন, শিৱনাথ : লোককৃষ্টিৰ উৎস, অসম প্ৰকাশন পৰিষদ, গুৱাহাটী, ১৯৮২

পাৰি পাৰ্শ্বিক নিয়ন্ত্ৰণত পৰিৱেশ নীতিশাস্ত্ৰৰ প্ৰাসংগিকতা

ৰমা কান্তি দাস
মুৰব্বী অধ্যাপিকা, দৰ্শন বিভাগ

বিশ্বৰ ইতিহাসত যোৱা সত্তৰ দশকটোক পৰিৱেশগত শিক্ষাৰ দশক (Decade of Environmental Education) বুলি কোৱা হয়। সেই সময়ত বিশ্বৰ প্ৰায় সকলো দেশতে পৰিৱেশ সম্পৰ্কীয় সজাগতা বৃদ্ধি পায়। সেই সময়ত পৰিৱেশ সম্বন্ধীয় অধ্যয়নে পৰিৱেশবিদসকলৰ উপৰিও প্ৰযুক্তিবিদ, বৈজ্ঞানিক আৰু সমাজ বিজ্ঞানীসকলৰ লগতে দাৰ্শনিকসকলৰো মনোযোগ আকৰ্ষণ কৰে। তাৰে ফলশ্ৰুতিত ১৯৭০ দশকত নীতিশাস্ত্ৰৰ এটি নতুন শাখা হিছাপে পৰিৱেশ নীতিশাস্ত্ৰই প্ৰতিষ্ঠা লাভ কৰে। পৰম্পৰাগত নৈতিক নীতি-নিয়মে মানুহ আৰু প্ৰকৃতিৰ নৈতিক সম্পৰ্ক নিৰ্ণয় কৰিবলৈ বিফল হোৱা বাবে পৰিৱেশ নীতিশাস্ত্ৰৰ সূত্ৰপাত ঘটে।

এই বিশ্বত মানুহৰ লগতে অন্যান্য জীৱৰো যে জীয়াই থকাৰ অধিকাৰ আছে — এই মূল্যবোধ লৈয়ে পৰিৱেশ নীতিশাস্ত্ৰৰ আৰম্ভণী হৈছে। পৃথিৱীখন কেৱল মানুহৰ বাবে নহয় সকলোৰে বাবে।

মানুহৰ অদূৰদৰ্শী কাৰ্যই যাতে পৃথিৱীখন মানুহৰ লগতে অন্যান্য জীৱৰ বাবেও বাসৰ অনুপযোগী নকৰে — এই বিষয়ে সজাগতা সৃষ্টি কৰাই ইয়াৰ মুখ্য উদ্দেশ্য। এক সুস্থ, সুন্দৰ পৰিৱেশ গঢ়ি তোলাৰ ক্ষেত্ৰত মানুহৰ দায়িত্ব তথা কৰ্তব্য যে নিহিত হৈ আছে তাৰ শিক্ষা দিয়াটোও ইয়াৰ প্ৰধান লক্ষ্য। সম্প্ৰতি মানৱ সভ্যতাৰ ক্ৰমবিকাশ, দ্ৰুত উন্নয়ন আৰু জনবিস্ফোৰণে সমগ্ৰ জীৱমণ্ডলৰ প্ৰতি ভাবুকি সৃষ্টি কৰিছে। মানুহে ইমানদিন মানৱ কেন্দ্ৰিক (Human Centric) দৃষ্টিভংগীৰে পৃথিৱীখনক যিমান পাৰি সিমান শোষণ কৰিলে, নিজৰ স্বাৰ্থত ব্যৱহাৰ কৰিলে। মানুহেই পৃথিৱীৰ সকলো সম্পদৰ গৰাকী আৰু সেই বাবে যিমান পাৰি সিমান প্ৰাকৃতিক সম্পদ আহৰণ কৰিবলৈ গৈ প্ৰকৃতিৰ ভাৰসাম্যত ব্যাঘাত জন্মাইছে। কৃষি, বাণিজ্য, শিল্প আৰু সামৰিক আদি সকলো দিশতে মানুহে নিজৰ শ্ৰেষ্ঠত্ব প্ৰদৰ্শন কৰিবলৈ গৈ মানৱজাতিৰ ভৱিষ্যৎ অসুৰক্ষিত কৰিছে। মানুহৰ ভোগবাদী



মানসিকতাৰ বাবে পৃথিৱীখন ব্ৰহ্মান্ধয়ে ধ্বংসৰ মুখলৈ গতি কৰিছে। ভাৰতীয় দৰ্শনৰ মতে এই বিশ্বখন মাটি, পানী, বায়ু, আকাশ আৰু জুই — এই পঞ্চ মহাভূতৰ দ্বাৰা সৃষ্টি হৈছে। এই পঞ্চমহাভূতক পবিত্ৰ বুলি স্বীকাৰ কৰা হৈছিল আৰু ইয়াৰ পূজা-অৰ্চনা কৰিছিল; কিন্তু, আজি মাটি, পানী, বায়ু আকাশ কোনোৱে পবিত্ৰ নহয়। এক কথাত ক'বলৈ গ'লে সমগ্ৰ জীৱ মণ্ডলেই প্ৰবল প্ৰদূষণৰ কবলত পৰিছে।

মানুহে ইচ্ছাকৃতভাৱে ভয়ংকৰ হানিকাৰক ৰাসায়নিক, জৈৱ ৰাসায়নিক, জৈৱিক-ভৌতিক-দ্ৰব্য এৰি দি মাটি, পানী, বায়ু, আকাশ বিষাক্ত কৰি তুলিছে। এটুপি বিশুদ্ধ খোৱা পানীৰ বাবে মানুহে মৌপিয়া চৰাইৰ দৰে হাঁহাকাৰ কৰিব লগা হৈছে। মানুহে নিজৰ জীৱনটোক আৰামদায়ক কৰিবলৈ গৈ পৃথিৱীৰ বক্ষ খান্দি ক্ষত-বিক্ষত কৰি আৰ্থিক সম্পদ আহৰণ কৰিছে। অত্যধিক প্ৰদূষণে নদ-নদী, সাগৰ-মহাসাগৰত বসবাস কৰা প্ৰাণী আৰু উদ্ভিদ সমূহৰ অস্তিত্বৰ সংকট আনিছে। মানুহে সৃষ্টি কৰা যন্ত্ৰপাতি আৰু বৈজ্ঞানিক পৰীক্ষা-নিৰীক্ষাই আকাশ তথা বায়ুমণ্ডল দূষিত কৰিছে।

জীৱ-জন্তু, গছ-গছনি সকলো প্ৰকৃতিৰ দান। প্ৰকৃতিৰ ভাৰসাম্য ৰক্ষা কৰাৰ ক্ষেত্ৰত ইহঁতৰ অমূল্য বৰঙণি আছে — এই কথা মানুহে সমূলি পাহৰি এফালৰ

পৰা জীৱ-জন্তু, গছ-গছনি ধ্বংস কৰি গৈছে। ইয়াৰ ফলত কিছুমান জীৱ-জন্তু, গছ-গছনি চিৰদিনৰ বাবে পৃথিৱীৰ বুকুৰ পৰা বিলুপ্ত হৈছে। মানুহৰ অত্যধিক ভোগ-লিপ্সাৰ বাবেই আজি জলবায়ু পৰিবৰ্ত্তন, গোলকীয় উষ্ণতাৰ দৰে ভয়াবহ সমস্যাই দেখা দিছে। সেয়েহে, পৰিৱেশ-নীতি শাস্ত্ৰই মানুহৰ এই মানৱ কেন্দ্ৰিক দৃষ্টিভংগীৰ পৰিবৰ্ত্তন ঘটাই এক পৰিবেশ কেন্দ্ৰিক দৃষ্টিভংগীৰে (Eco-Centric) জীৱন আৰু জগতৰ অৱলোকন কৰিবলৈ প্ৰয়াস কৰিছে।

প্ৰকৃতিৰ এক স্বাধীন সত্তা আছে আৰু ইয়াক মানুহে সম্পূৰ্ণ নিজৰ নিয়ন্ত্ৰণলৈ নিব নোৱাৰে, বৰং মানুহে প্ৰকৃতিৰ অধীন — এই সত্যতা উপলব্ধি কৰোৱাটো পৰিৱেশ-নীতিশাস্ত্ৰৰ উদ্দেশ্য। মানুহ কেৱল এখন কংক্ৰিটৰ পৃথিৱীত জীয়াই থাকিব নোৱাৰে। মানুহক লাগে এখন ধুনীয়া পৃথিৱী। মানুহে যেতিয়া প্ৰকৃতিক সন্মান কৰিবলৈ শিকিব, তেতিয়াহে পৃথিৱীখন ধুনীয়া হ'ব। কিন্তু, প্ৰকৃতিৰ ভাৰসাম্যতা আৰু সৌন্দৰ্য সদায় মানুহৰ মানসিকতা আৰু সংবেদনশীলতাৰ ওপৰত নিৰ্ভৰ কৰে। পৰিৱেশ সুৰক্ষিত হ'লেহে মানৱ জাতিৰ ভৱিষ্যৎ সুৰক্ষিত হ'ব — এনে জনমত গঢ়ি তুলিবলৈ পৰিৱেশ-নীতিশাস্ত্ৰই চেষ্টা কৰিছে।

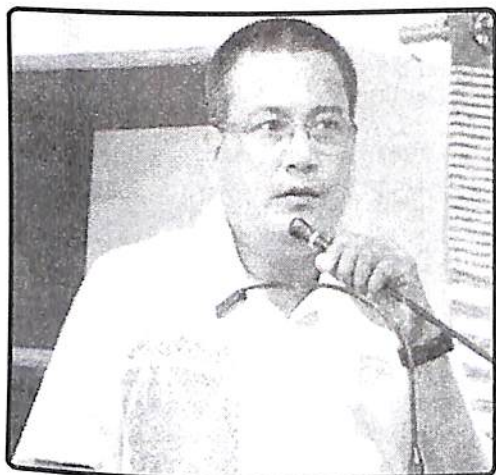
প্ৰাকৃতিক সম্পদৰ অপচয় ৰোধ, ব্যক্তিগত লাভা-লাভৰ বাবে প্ৰকৃতি অনিষ্ট সাধন ৰোধ কৰা, জীৱমণ্ডলৰ সকলো

উপাদানৰ প্ৰতি শ্ৰদ্ধাশীল হোৱা, ব্যক্তিৰ কোনো কাৰ্যই যাতে পাৰিপাৰ্শ্বিক বাতাবৰণ প্ৰদূষিত নকৰে — তাৰ প্ৰতি দৃষ্টি ৰখা, ভৱিষ্যৎ প্ৰজন্মৰ বাবে সুন্দৰ ৰূপত প্ৰকৃতিক সংৰক্ষণ কৰা, অন্যান্য জীৱৰ দৰে মানুহো যে পৃথিৱীৰ এবিধ জীৱহে, কোনো কাৰণতে মানুহ অন্য জীৱতকৈ শ্ৰেষ্ঠ নহয় সেই কথা উপলব্ধি কৰোঁৱা, অইন কথাত ইতৰ জগতৰ ওপৰত মানুহৰ প্ৰভূত্ব হ্ৰাস

কৰা বা শ্ৰেষ্ঠত্ব অস্বীকাৰ কৰি সকলোৰে সম অধিকাৰ প্ৰতিষ্ঠা কৰা, বহনক্ষম উন্নয়নৰ (Sustainable Development) যোগেদি সকলোৰে মংগল চিন্তা কৰা আদি বিষয়ৰ ওপৰত আলোকপাত কৰি পৰিৱেশ-নীতিশাস্ত্ৰই সচেনতা জগাই তুলিবলৈ যত্ন কৰি আহিছে। সেয়েহে, বৰ্তমান পাৰিপাৰ্শ্বিক নিয়ন্ত্ৰণত পৰিৱেশ-নীতিশাস্ত্ৰৰ প্ৰাসঙ্গিকতা আহি পৰিছে।



SOME MOMENTS OF SOFEC ACTIVITIES DURING 2016-17 IN IMAGES



Principal Dr. S. K. Saikia
at SOFEC Program



DHE Assam Dr. P. Jidung
at SOFEC Program



Invited Guest
Dr. Ranjan Kr. Das at
SOFEC Program



SOFEC Invited Guest
Soumyadeep Dutta,
Director, Nature's Beckon

LIST OF MEMBERS OF THE SOCIETY FOR ENVIRONMENTAL CONSERVATION (SOFEC), 2016-2017

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Mr. Anup Jyoti Bharali	do	Mr. Deimun Shang DOUNGEL	do
Dr. Nitumoni Saikia	do	Dr. Priyadev Goswami	(Mathematics)
Dr. Sunanda Sahu	do	Mrs. Rama Kanti Das	(Philosophy)
Dr. Bhaskar Das	do	Mrs. Urmila Ramchiary	do
Mr. Ananta Teron	(Assamese)	Mrs. Hiramoni Lalung	do
Mrs. Anjumoni Phukan	do	Mrs. Mauchumi Hazarika	do
Mrs. Sikhhamoni Konch Deori	do	Dr. Jyoti Prasad Phukan	(Physics)
Dr. Monmi Baruah	do	Mr. Aditya Dahal	do
Ms. Kumkum Chakraborty	(Bengali)	Mr. Titus Bhengra	(Political
Dr. Reeta Poddar	do	Science)	
Mr. Rajib Lochan Borah	(Botany)	Dr. Lamkholal DOUNGEL	do
Dr. Alakananda Baruah	do	Mrs. Nirmali Pegu	do
Mrs. Dinalisha Bora	do	Dr. Biraj Dutta	do
Dr. Bhaswati Kakoti	do	Mrs. Kalyani Das	(Sanskrit)
Dr. Shikhamoni Sharma	(Chemistry)	Mrs. Bini Saikia	do
Dr. Anisha Dutta	do	Dr. Nazimuddin Ahmed	(Statistics)
Mrs. Rubab Fatema Numani	(Economics)	Mrs. Sudakshina Das	(Zoology)
Mr. Narendra Mahela	(Geography)	Mr. Tikendrajit Gogoi	do
Dr. Mitali Chaliha	do	Mrs. Sultana Hazarika	do
Mrs. Kalpana Sengupata Baruah	(Hindi)	Dr. Sanchita Baruah	do
Mr. Krishna Kanta Bordoloi	do	Mr. Rajesh Kr. Shah	do

SOFEC ACTIVITY LIST, 2016-17

Date	Occasion	Programme	Resource person/ Chief guest	Venue	Participant / audience
5. 6. 2016	World Environment Day In collaboration with the NSS of DHSK College	Art competition		Room No 6	Children of teaching and non teaching staff of DHSK College
		Open session & prize distribution	P. Jidung, DHE Assam,	Srimanta Shankardev Sabhakakhya	Teachers, students and non teaching staff
		Tree plantation		DHSK Girl's Hostel Campus	All members and children participating in Tree plantation
12. 8. 2016	14 th Foundation Day of SOFEC	Lecture on 'Biodiversity of Mishimi Hills of Arunachal Pradesh'	Dr. Ranjan Kr. Das, Assoc. Professor, Tinsukia College	Srimanta Shankardev Sabhakakhya	Teachers, students and non teaching staff
21. 9. 2016	Biosphere Day	Lecture on 'Biodiversity of North East India'	Mr. Saumyadwip Dutta Director, Nature's Beckon	Srimanta Shankardev Sabhakakhya	Teachers, students and non teaching staff
		Drama- Apocalypse by the students of the Department of Zoology		Do	Do
		Extempore speech Competition	Dr. Chandana Goswami Prof. Kumkum Chakraborty Prof. Rajib Lochan Bora	Do	Students of the college
10. 4. 2017	Photo album				
20. 5. 2017	<i>Nature</i> an annual magazine of SOFEC, Edited by Professor Rajib Lochan Borah				

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DHSK COLLEGE, DIBRUGARH**

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I hereby declared that the particulars furnished in the above are true to the best of my knowledge and belief, I have read the Constitution and agreed to abide and adhere to the rules and regulations of the organization and in my own capacity shall endeavor to achieve its objectives. In the event of my noncompliance with working of the system and nonrenewal of membership my membership may automatically stand terminated.

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Foundation day Programme of SOFEC



Judges, at the Extempore Speech on Environmental issues



Students Drama on Environment



President of SOFEC at Biosphere day



Vice Principal, Principal Dr. L. Doungel with Invited Guest Dr. Ranjan Kr. Das at Foundation Day



World Environment Day



World Environment Day



Plantation Programme on SOFEC Foundation Day



Children's Arts Competition on World Environment Day



Participating Members



Teachers and Students