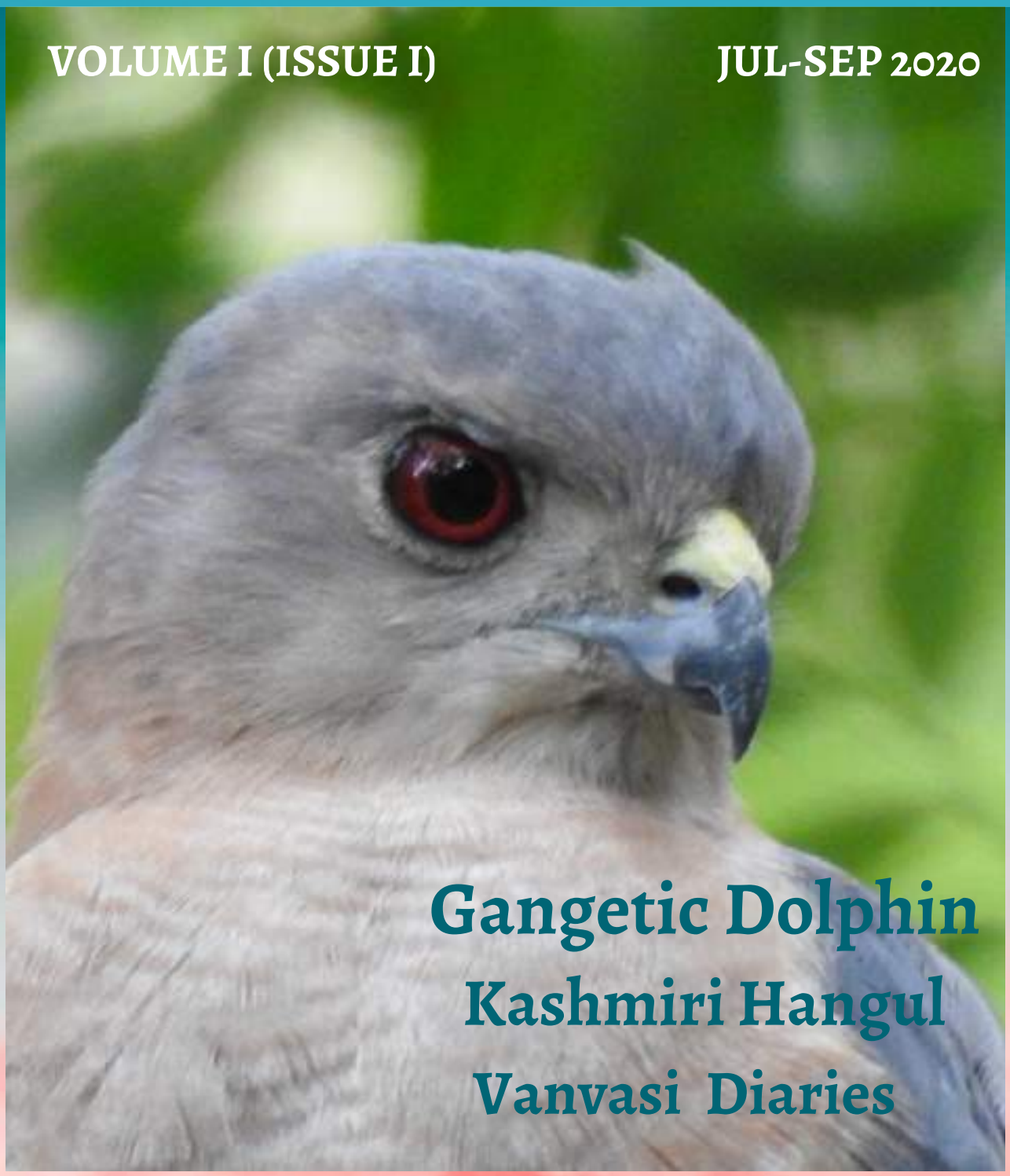
SRISHTI सृष्टि

BILINGUAL E-MAGAZINE

VOLUME I (ISSUE I) JUL-SEP 2020



Gangetic Dolphin
Kashmiri Hangul
Vanvasi Diaries

THE ENVIRONMENT SOCIETY
P.G.D.A.V. COLLEGE (EVENING)
(University of Delhi)

SRISHTI- BILINGUAL E-MAGAZINE
Volume I (Issue I)
July-September 2020

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SRISHTI

***Srishti*: Quarterly Published Bilingual E-Magazine of Environment Society (*SRISHTI*)**
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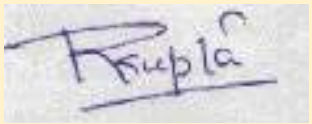
प्राचार्य की कलम से ...

सृष्टि - ई मैगज़ीन के शुभारंभ के लिए पर्यावरण समिति को हार्दिक बधाई और शुभकामनाएं। यह ई-मैगज़ीन हमारे उन सभी विद्यार्थियों को एक सशक्त मंच प्रदान करेगा जो अपनी पर्यावरण संबंधित रचनात्मकता को लेखनी के माध्यम से अभिव्यक्त करना चाहते हैं। 'सृष्टि' समिति द्वारा एक नई 'सृष्टि - ई मैगज़ीन' के रूप में यह प्रथम प्रयास अत्यंत सुन्दर, रोचक और ज्ञानप्रद बन गया है। इस मंच का सभी विद्यार्थी भरपूर लाभ उठाएंगे और इसके भविष्य के विस्तार और इसकी गुणवत्ता बनाए रखने के लिए अपना पूर्ण सहयोग और योगदान देंगे, ऐसी आशा ही नहीं, पूर्ण विश्वास है। यह ई-मैगज़ीन भविष्य में सफलता के नए आयाम स्थापित करे, ऐसी हार्दिक शुभकामनाएँ व्यक्त करता हूँ। प्रारंभ का एक छोटा कदम ही अंत में एक बड़ी छलांग बनता है।



डॉ. आर.के. गुप्ता
प्राचार्य

From Principal's Desk

My heartiest congratulations to the environment society of the college – *Srishti* – for its new creation *Srishti – The E-magazine* which truly epitomizes the very name of the society. It is an ambitious beginning, a welcome initiative and a 'dream come true' for the society. The void has been filled. My best wishes for the success of this E-magazine. May this small sapling grow into gigantic tree bearing fruits and blossoms!

I am greatly impressed by the rich, highly qualitative, topical and contextual contents of this inaugural issue. For this, I would like to express my heartfelt thankfulness and sincere appreciation for the Editorial Board and the entire team of the society particularly Mrs. Renuka Dhar Bajaj - the inspiring convenor and Dr Mayank Pandey - the dynamic member of the society.

Concepts of environment protection and co-existence with nature are inherent in Indian culture and traditions. These need to be explained and elaborated scientifically to make students aware how nearer to Nature our ancestors were and how comfortably we can still follow them to save the environment. Similarly, the concepts of development - as per the modern definitions - and environment protection seem to be inversely related. Striking a judicious balance between the two is much needed. The inclusion of observations of environment audit in the policy making process may be a solution.

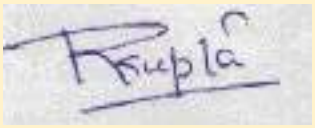
All these issues and many more may be the areas on which *Srishti* may focus in its future editions.

We human beings are *part of Nature*. The moment we think we are *apart from Nature*; we invite disaster and agony. Our well-being is a dependent variable of a set of independent

variables - including our deeds, behavior, activities, conducts etc - whose compatibility with Nature finally decides the chorus of our well-being. Greater the compatibility, better we feel and *vice-versa.*

Environment society, Srishti's seamless efforts through its varied and well diversified activities to inculcate among students a passion of how to enhance their own compatibility and emotional bonding with Nature is appreciable and commendable without any qualifications. These sincere efforts must have been translated into and manifested through day to day practices and actions of the students.

I wish the society tread upon a path full of successes and achievements ornamenting *Srishti – The E-magazine* with flavors and fervors. Congratulations once again to the entire team and the Editorial Board.



Dr. R.K. Gupta

Principal

From Convener's Desk

It gives me immense pleasure to write this message as the Convener of '***Srishti***'- the extremely vibrant and active Environment Society of P.G.D.A.V. College (Evening). Constantly inspired and nudged on by our mentor and Principal Dr. R.K. Gupta, Team Srishti has been raising awareness about environmental issues through Quiz Programs, Debates, Poster-making competitions, Competitions involving creative use of waste materials as well as special cleanliness drives within the college premises. We have also had the pleasure of arranging Talks and Webinars by environment experts to instill awareness amongst our students. Now another feather is being added to Team Srishti's cap, in the form of an E-Magazine. The collaborative and enthusiastic efforts of the students and faculty members, who comprise the lively team, are responsible for this proud venture. The E-Magazine will seek to highlight and discuss issues pertaining to the world we live in and thus make an attempt to create responsible citizens. In the words of the Dalai Lama: "It is our collective and individual responsibility...to preserve and tend to the world in which we all live."

Welcome to the first edition of 'Srishti' and happy reading!

Best wishes

Renuka Dhar Bazaz
(Convener, Environment Committee)

Message from Society's President

I feel proud and privileged to be associated with *Srishti* – the environment society of P.G.D.AV. College (Evening), University of Delhi. Under the inspirational and motivational force of our respected Principal sir, Dr. R.K. Gupta and expert guidance of Convener Ms. Renuka D. Bazaz and other faculty members of the society, *Srishti* regularly organizes events like annual fest, quiz, debate, poster making etc. at intra and inter-college level. The society also conducts events like cleanliness drive, plantation drive, invited talks and webinars to propagate the idea of environment conservation and awareness among the youths. Recently, *Srishti* participated in Tide Turner- multi-phased global awareness program on plastic waste, jointly organized by the WWF-India, UN Environment and CEE. 'Team *Srishti*' consists of faculty members and a dedicated group of students from diverse discipline which completes all the given tasks and assignments in an excellent coordinated manner.

As a big leap, the society is releasing '*Srishti*' – E-magazine, which will be published online at the quarterly interval. The magazine will cover conventional and concurrent environmental issues through the features like articles, poems, facts and figures, environmental puzzles, nature photography page etc. The magazine will also have a special section on the contributions of tribes and tribal communities, since ages, towards environmental conservation. All the designing and drafting works have been done by the 'Team *Srishti*' itself. 'Team *Srishti*' assures our readers and audience that we will try to publish the best possible contents on the environmental issues.

To conclude my words, I have no words to thank my team members who worked very hard to transform the idea into the reality. 'Team *Srishti*' is indebted to our Principal Sir, Dr. R.K. Gupta, Convener, Ms. Renuka Ma'am and all the faculty members of the society for their consistent support and suggestions.

Thanking you,

Ayush Raj

Ayush Raj

FOREWORD

I am delighted and feeling proud to introduce '*Srishti*' – E- magazine of the environment society of P.G.D.A.V. College (Evening). The idea, to launch a quarterly e-magazine, could have been possible only because of the inspiration, motivation and support of our revered principal, Dr. R.K. Gupta and consistent guidance and cooperation of the esteemed Convener of the society, Ms. Renuka D. Bazaz. The Environment Society of the college is fortunate to have a team of learned, experienced and dedicated faculty members who give valuable suggestions and consistent cooperation time and again. The e-magazine will be quarterly published online and the editorial team will try to cover wide spectrum of literature related to the issues and challenges of the environment and the tangible solutions. The sole target of releasing the magazine is to provide a platform to the students and faculty members so that they can express their creativity on environmental issues. Also, the magazine will create interest and awareness among the readers as it will contain articles, guest article, poems, crosswords and many other things from diverse domains of the environment. 'Team *Srishti*' will do every bit to maintain the quality and content of the magazine and all the constructive suggestion to augment the value and level of the same will always be welcomed.

I, hereby, wrap up my words by again conveying my sincere gratitude to our Principal and Convener for their precious support, suggestions and motivation. My warm regards to all the faculty members of the society for their valuable cooperation. My deepest thanks to Dr. Karishma Saraswat, Associate Editor (Hindi) and Ms. Sonia Dhingra, Associate Editor (English) who have given their valuable time for the editing task. My gratitude and thankfulness to all the authors of the first issue with special gratitude to Dr. Sameer Sinha, Head of Conservation at Wildlife Trust of India for contributing the informative article on

Gangetic Dolphins and Project Dolphin. The core strength behind the 'Team *Srishti*' is dedicated student volunteer group who worked hard and coordinated extremely well to crystallize the concept of e-magazine. I would like to congratulate the student team for their job and convey my best wishes to them.

With best wishes!

Dr. Mayank Pandey
(Editor-in-Chief)

विशेषज्ञ वाटिका

गांगेय डॉल्फिन - परिचय एवं संरक्षण

डा. समीर कुमार सिन्हा
वाइल्डलाइफ ट्रस्ट ऑफ इंडिया

गंगा नदी की डॉल्फिन के संरक्षण की बात का पहला लिखित प्रमाण महान सम्राट अशोक के पंचम शिलालेख में मिलता है जहाँ यह 'गंगा पुपुताका' के नाम से वर्णित है। विगत 25-30 वर्षों में इसके संरक्षण के प्रयास काफी तेज हुए हैं। इसी कड़ी में एक और अध्याय जुड़ा जब इस वर्ष के स्वाधीनता दिवस के संबोधन में माननीय प्रधानमंत्री ने लाल किले की प्राचीर से देश में 'प्रोजेक्ट डॉल्फिन' शुरु करने की घोषणा की। इसके साथ ही देश के वन्य जीव प्रेमियों एवं संरक्षणकर्ताओं के बीच इस संकटग्रस्त जीव के अस्तित्व को बचाने की दिशा में एक और राह दिखाई दे रही है। देश इसे 2009 में 'राष्ट्रीय जलीय जीव' का दर्जा दे चुका है।

वैसे तो 'प्रोजेक्ट डॉल्फिन' में समुद्री डॉल्फिन के संरक्षण कार्यों का भी समायोजन होगा, लेकिन इससे गांगेय डॉल्फिन के संरक्षण को निश्चित तौर पर एक नई दिशा मिलेगी। गंगा की डॉल्फिन के बारे में बताने से पहले कुछ सामान्य जानकारी की बातें करना चाहूँगा। जलीय-जीवों में डॉल्फिन शायद मनुष्य को सबसे ज्यादा आकर्षित करती है, और इसकी बुद्धिमता के सभी कायल हैं। डॉल्फिन का नाम लेते ही अधिकतर लोगों के सामने विदेशों में डॉल्फिनेरियम में करतब दिखाती डॉल्फिन की तस्वीर सामने आती है। वह डॉल्फिन समुद्री होती है। इन करतब दिखाती डॉल्फिन से अलग होती है नदी की डॉल्फिन। नदियों के मटमैले माहौल में रहने के कारण प्रकृति ने इनके आँखों की उपयोगिता कम कर दी है और आँखे ना के बराबर काम करती हैं। ये अपने आस-पास के माहौल और भोजन की जानकारी के लिए इको-लोकेशन का सहारा लेती हैं।

नदी की डॉल्फिन भी समुद्री डॉल्फिन के साथ वैज्ञानिक वर्गीकरण में इन्फ्रा-आर्डर 'सिटेसिया' की सदस्य होती है। सिटेसिया वस्तुतः जलीय स्तनधारी प्राणियों का एक वर्ग है, जिनके शरीर के ऊपर रोएँ अथवा बाल नहीं होते हैं, तथा अन्य स्तनधारियों की तरफ बाहर की ओर कान

भी नहीं होता है। हाँ, कान वाले स्थान पर छिद्र जरुर होता है। इनका शरीर जल में रहने के लिए अनुकूलित होता है। इनके पतले चमड़े के नीचे वसा या चर्बी की मोटी परत - ब्ल्बर, होती है जो इसे ठंड से बचाती है। व्हेल भी इसी इन्फ्रा-आर्डर 'सिटेसिया' का सदस्य है।

जहां तक नदी में पाई जाने वाली डॉल्फिन की प्रजातियों का सवाल है, वर्तमान में विश्व में इनकी केवल 3 प्रजातियां ही मौजूद है, तथा यह एशिया एवं लैटिन अमेरिका की गिनी चुनी नदियों तक ही सीमित है। भारतीय उपमहाद्वीप में पाई जाने वाली प्रजाति को साउथ एशियन रिवर डॉल्फिन कहा जाता है। इसका वैज्ञानिक नाम प्लाटानिस्टा गंगेटीका है। इसकी एक उप-प्रजाति गांगेय डॉल्फिन है जो गंगा- ब्रह्मपुत्र-मेघना नदी प्रणाली में भारत, नेपाल और बांग्लादेश में पाई जाती है। इसे सोंस, सुसु आदि नामों से भी पुकारा जाता है। दूसरी उप-प्रजाति सिन्धु नदी की डॉल्फिन है जो पाकिस्तान के सिन्धु एवं सहायक नदियों में मिलती है। इसे भूलन भी कहते हैं। दूसरी प्रजाति है - आमेजन नदी की डॉल्फिन जिसे बोटो भी कहते हैं। लैटिन अमेरिका में ही पाई जाने वाली एक अन्य तथा तीसरी प्रजाति है ला-प्लाटा डॉल्फिन। इसके अलावा यांग्जी नदी में भी एक डॉल्फिन की प्रजाति पाई जाती थी जिसे बाईजी कहा जाता था। पिछले कई वर्षों से वैज्ञानिक इसे देख नहीं पाए और हाल ही में इसे विलुप्त मान लिया गया है।

भारत में सिन्धु नदी की डॉल्फिन की भी एक छोटी आबादी पाई जाती है - पंजाब के ब्यास नदी में, जहाँ इनकी संख्या एक दर्जन से भी कम है। अर्थात, भारत में गंगा की डॉल्फिन के साथ ही साथ सिंधु नदी की डॉल्फिन भी पाई जाती है। गांगेय डॉल्फिन की संख्या करीब 3500 के आस-पास है तथा यह मुख्य रूप से गंगा एवं उसकी सहायक नदियों - जैसे, घाघरा, गंडक, कोशी, महानंदा, चंबल आदि के साथ ही साथ ब्रह्मपुत्र एवं उसकी सहायक नदियों में पाई जाती है। अगर राज्यवार स्थिति देखे जाए तो गंगा एवं उसकी सहायक नदियों में पाई जाने वाली डॉल्फिन की आधी आबादी बिहार राज्य में पाई जाती है।

विगत कुछ दशकों में इसकी संख्या में अप्रत्याशित गिरावट दर्ज की गई है। कई नदियों अथवा उसके भागों से यह पूर्ण रूप से विलुप्त हो गई। 1960-70 के दशक में जिन नदियों में यह बहुतायत में पाई जाती थी उनमें से कई नदियों में सिर्फ गिनी चुनी बच गई हैं। इस डॉल्फिन की आबादी विभिन्न प्रकार के मानवीय क्रियाओं के परिणामों के दंश झेल रही है। जहां एक ओर गंगा की डॉल्फिन का शिकार किया गया, वही दूसरी ओर नदियों के प्रदूषण तथा जल संसाधन के विकास के हेतु संरचनाओं खास-कर डैम और बैराज के निर्माण के कारण इनके ऊपर के नदी क्षेत्रों में इनकी संख्या नगण्य हो गई, कई जगहों से ये विलुप्त भी हो गए। वस्तुतः डैम एवं बैराज इसकी जनसंख्या को छोटे-छोटे उप-जनसंख्या में बांट देते हैं, परिणाम

स्वरूप इनके बीच अनुवांशिक आदान-प्रदान एवं प्राकृतिक प्रसार नहीं होने के कारण डैम के ऊपर की आबादी विलुप्त होने के कगार पर चली जाती है।

शिकार डॉल्फिन को सीधे तौर पर क्षति पहुँचाता है। कभी-कभी यह मछुआरों के मछली मारने वाले जाल में फँसकर डूब कर मरते हैं तो कभी-कभी मछुआरे जाल में फंसने के बाद लालच-वश इसे जाल से निकालने का प्रयत्न नहीं करते और मार देते हैं। यह लालच होता है - डॉल्फिन के चमड़े के नीचे की बसा की परत। इस बसा से निकले तेल का इस्तेमाल दवा के लिए किया जाता है। लेकिन, उससे भी ज्यादा इसका प्रयोग कुछ विशेष प्रकार की मछली को फसाने के लिए चारा बनाने में किया जाता है। कभी मछुआरे बरछी / भाला जैसे हथियारों से भी इनका शिकार करते थे, पर अब यह करीब-करीब बंद हो गया है।

डॉल्फिन के शरीर में कई तरह के हानिकारक रसायनों जैसे- ऑर्गेनोक्लोरिन कीटनाशक, ब्युटाइयिल्टिन, परफ्लोरिनेट आदि के मिलने की भी पुष्टि हुई है। माना जाता है कि इन रसायनों का प्रभाव डॉल्फिन के स्वास्थ्य पर पड़ता है। वैसे इस जीव के सामने सुरसा के जैसे मुंह बाये खड़ी है नदियों में पानी की समस्या। डॉल्फिन गहरी और लगातार प्रवाह वाली नदियों में रहते हैं, लेकिन आज नदी जल को विभिन्न विकास कार्यों के लिए डैम बनाकर मोड़ दिया जा रहा है - जैसे सिंचाई एवं विद्युत उत्पादन के लिए। इससे नदी में पानी का प्रवाह कम हो जाता है, जिसका सीधा असर डॉल्फिन की आबादी पर पड़ता है।

पिछले कुछ वर्षों में जहाँ डॉल्फिन पर खतरे बढ़े हैं, इनकी संख्या कम हुई है, वहीं इसके संरक्षण के प्रयास भी हुए हैं। इनके ऊपर अनुसन्धान के अलावे बिहार राज्य में डॉल्फिन संरक्षण के लिए 1991 में सुल्तानगंज से कहलगांव के बीच करीब 50 कि.मी. लंबाई में विक्रमशिला गांगेय डॉल्फिन आश्रयणी की स्थापना की गई है। ब्रह्मपुत्र एवं गंगा नदी के किनारे अवस्थित मछुआरों के बीच डॉल्फिन के तेल के स्थान पर मछलियों के अपशिष्टों से निकाले गए तेल का उपयोग मछली मारने के लिए करने हेतु जागरूकता कार्यक्रम चलाए गए। बिहार में प्रतिवर्ष 5 अक्टूबर को डॉल्फिन दिवस मनाया जाता है, जिसका उद्देश्य है इस संकटग्रस्त प्राणी के बारे में अधिक से अधिक जागरूकता फैलाना। मोटे तौर पर मछुआरों के बीच इस बात की जागरूकता तो हो गई है कि डॉल्फिन मारना एक क़ानूनी अपराध है क्योंकि यह जीव देश के वन्य-प्राणी संरक्षण अधिनियम की अनुसूची -1 में बाघ, हाथी, गैंडा सरीखे जानवरों के साथ रखा गया है तथा इसे उतनी ही क़ानूनी सुरक्षा प्राप्त है। लेकिन, इस क़ानूनी प्रावधान को और प्रभावी तरीके के लागू करने की जरूरत है। हालांकि, हमारे सामने यक्ष प्रश्न है - नदियों से जल-प्रवाह को कैसे बढाएं एवं बनाए रखा जाए ताकि गांगेय डॉल्फिन को हमारी आने वाली पीढियां भी देख सकें।

THE KASHMIRI HANGUL: AN ENDANGERED ANIMAL

(Ms. Renuka D. Bazaz, Convener)

The Valley of Kashmir, located in northern India, is a natural haven for flora and fauna. The moderate climate and abundance of water bodies ensures a unique bounty of nature with a rich and diverse variety of plants and animals. However, the Vale continues to lose its biodiversity at an alarming rate due to factors like habitat destruction, overgrazing, deforestation, pollution, unsustainable harvesting of natural resources and introduction of invasive and alien species. Some of the prominent animals found in Kashmir are Hangul, Markhor, Tibetan Wild Dog, Kashmir Musk Deer, Chiru, Tibetan Gazelle, Snow Leopard, Himalayan Tahr. Unfortunately, many of them now figure in the list of endangered animals.

The Kashmir stag or Hangul, as it is known, is critically endangered. It is a subspecies of elk native to Kashmir and found in the valleys and dense forests. It can also be sighted at the Dachigam National Park in Srinagar, where the Hangul receives protection. Overgrazing by domestic livestock and rampant poaching have reduced the Hangul to a rare and endangered species even though the numbers were between 3000-5000 in the 1940s. According to the census conducted in 2019, there are only 237 Hanguls left in Kashmir. Known for its magnificent antlers with 11 to 16 points, the Hangul was once found in many parts of the erstwhile State of Jammu and Kashmir, including the forests of Kishtwar and Bhaderwah. In 1970, the State Govt. in collaboration with the IUCN (International Union for Conservation of Nature) and the WWF, started 'Project Hangul' for the conservation of these animals. This has shown some results although the numbers are still not enough to take the animal off the 'critically endangered' list.

The Hangul is considered as significant to Jammu & Kashmir as the tiger is to the whole of India, it is the State animal of Jammu & Kashmir. It is the only Asiatic survivor or sub-species of the European red deer. Although similar in appearance, unlike its European counterpart, its coat is not red but dark grey or dark brown in colour. The name 'Hangul' is said to have come from its preferred food—horse chestnuts or 'Han Doon', as it is known as in Kashmiri. Its distinctive antlers, called 'Heng' in the local language, could also have contributed to the name. Hanguls are known to enjoy basking in the sunlight and therefore favour ridges facing southwards.

Source: https://www.thekashmirmonitor.net/thanks-to-project-tiger-majestic-hangul-gets-a-new-lifeline-in-kashmir/

Influx of livestock herds of Gujjars (nomadic tribes) near Dachigam, has resulted in depletion of this deer species that is now nearing extinction. Kashmiri wildlife experts also blame the lack of a strong political will for the reduction in numbers. They believe that easy movement and intermixing of populations along the traditional route from Tral to Dachigam and Tulail could revive the Hangul's original habitat and help the species fight biological and ecological challenges. There are claims that the movement of militants as well as security forces, often with dogs, are scaring the Hangul away from its natural habitat. The Hangul, which can live up to ten years, plays a unique role in the region's food chain. Being herbivorous animal, it ensures the grassland lines survive and are not swept away by the forest ranges. A Hangul, as prey, can satiate the hunger of a leopard for 5-10 days and thereby reduce man-animal conflict.

The elusive Hangul is known to have fascinated many important personalities connected with Kashmir, from Jammu & Kashmir's last Maharaja, Hari Singh, to former Prime Minister of India, Indira Gandhi. Maharaja Hari Singh had built a rest house at the Dachigham Sanctuary to enable sighting of the Kashmiri stag. For Mrs Gandhi, no visit to Kashmir was complete without a few days spent at the Dachigam rest house. The dwindling numbers of this near-extinct animal have often been likened to the miniscule community of Kashmiri Pandits, both having been uprooted from their natural habitat. There is a Kashmiri idiom which refers to someone staring without comprehension as a 'Hangul'. In other words, this rare animal is an inseparable part of the culture and history of the Valley and needs to be saved and protected.

जनसंख्या और पर्यावरण

(आदित्य सिद्धार्थ)
(बी.ए. प्रोग्राम 17/4261)

प्रकृति को यदि मनुष्य हेतु ईश्वरप्रदत्त सर्वोत्तम उपहार कहा जाए तो कोई अतिशयोक्ति नहीं होगी।अपने जीवन में हम प्रत्यक्ष अथवा अप्रत्यक्ष रूप से सब कुछ प्रकृति से ही पाते हैं। प्रकृति के प्रेमपूर्ण पालन से इस धरा का प्रत्येक जीव लाभान्वित होता है। प्राचीन समय से ही समस्त जीवों की प्राण - वाटिका को प्रकृति अपनी अमृतधारा से सींचती आई है। मानव - प्रकृति का घनिष्ठ संबंध दोनों के ही समुचित कल्याणार्थ अनिवार्य है। प्राकृतिक स्रोतों का दोहन करके ही आज मानव - जाति सर्वोन्नत सभ्यता के पद पर आसीन है..... परंतु, जैसे एक विशाल वट - वृक्ष को देख, छोटे से लेकिन उसके जन्मदाता बीज को नहीं भुलाया जा सकता, ठीक वैसे ही इस आधुनिक जगत की प्रगति के पीछे प्राकृतिक संपदा के प्रमुख योगदान को विस्मृत नहीं किया जा सकता।

भारत सदा से ही विश्व को शांति व प्रेम का संदेश देता आया है किंतु ये स्नेह-सिक्त भाव मात्र मनुष्यों तक ही सीमित न होकर इस संपूर्ण संसार के लिए हैं। यही कारण है कि हमारे सांस्कृतिक पर्व व रस्में प्रकृति के इर्द-गिर्द विचरण करते हैं। यहाँ की लोक कथाएँ व आंचलिक आख्यायिकाएँ हमारी नैसर्गिक संपदा के प्रभुत्व का गायन करती आईं हैं। हमारा इतिहास ऐसे वीर आत्मोत्सर्गियों का साक्षी रहा है जिन्होंने अपने प्राणों की परवाह किए बिना भी पर्यावरण रक्षण को सर्वोपरि प्राथमिकता प्रदान की। हमारी संस्कृति साहचर्य, सद्भावना और सहयोग की संस्कृति है। इसके विपरीत पश्चिमी जगत को देखें तो उनकी भौतिक सुख केंद्रित उपभोग की संस्कृति है। उनके लिए मानवीय सुख सर्वावश्यक है। भले ही उसके लिए किसी भी मानवेतर जाति को क्षति क्यों न पहुँचे। इस भौतिक लक्ष्य को प्राप्त करने की तन्मयता यूँ तो विज्ञान और तकनीकी क्षेत्र में कालजयी क्रांति लाती प्रतीत होती है किंतु सिक्के का दूसरा पहलू यह कि हम आज पृथ्वी की प्राकृतिक संपत्ति का एक भाग खो रहे है। जिस पर चिंतनीय विषय यह कि अब भी पर्यावरणक्षरण पर पूरी तरह से विराम नहीं लगा है। मानव की ऐसी अनुचित गतिविधियों की एक लंबी सूची बनाई जा सकती है, जो आधुनिकता के इस काल - यज्ञ में घृताहुति का कार्य कर रही हैं। यदि शीघ्र ही इन सब को रोका न गया तो यह कालाग्नि जल्द ही संपूर्ण धरा को लील जाएगी।

प्रकृति के जैविक - अजैविक घटकों से निर्मित यह पर्यावरण सटीक व स्वाभाविक रूप से सर्वोचित नियमानुसार निरंतर चलायमान है। इस सुसंबद्ध व सुगम चक्र में किसी भी प्रकार के परिवर्तन की आवश्यकता प्रतीत नहीं होती। यहाँ तक कि किसी भी प्रकार के अनुचित परिवर्तन से हमारा पर्यावरण स्वतः ही निपट लेता है लेकिन जैसे हर चीज़ की अपनी एक सीमा होती है, वैसे ही प्राकृतिक सहनशीलता भी एक निश्चित सीमा तक कार्य करती है। प्रकृति की स्वाभाविक सहिष्णुता जब समाप्त हो जाती है तो यह अवांछनीय परिवर्तन ही पारिस्थितिकीय - असंतुलन को जन्म देने लगता है। परिणामस्वरूप, यह असंतुलन प्रकृति के समस्त घटकों व जीव - जंतुओं को न्यूनाधिक मात्रा में प्रभावित करने लगता है और जैसे - जैसे इस असंतुलन में निरंतर वृद्धि होती है, वैसे - वैसे हमारे पर्यावरण में नवीन विषमताएँ व कठिनाइयाँ जन्म लेती हैं। यूँ तो आज विश्वव्यापी स्तर पर हम प्रदूषण, भूमण्डलीय - ऊष्मन, प्राकृतिक संपदाओं के विलोपन व प्राकृतिक आपदाओं जैसे अनेक दुःखद - दंशों को झेल रहे हैं। फ़िर भी, इन सभी परिणामों के पीछे जो परोक्ष परंतु प्रमुख कारण उभर कर आता है, वह है - जनसंख्या वृद्धि।

सुख - सुविधाएँ, रहन - सहन व स्वास्थ्य सेवाओं में सुधार आने के उपरांत प्रगतिशील राष्ट्रों में जनसंख्या विस्फोट हुआ। आवश्यकता अविष्कार की जननी है और जनसंख्या में बढ़ोतरी होने पर समाज की आवश्यकताएँ भी बढ़नी आरंभ हुईं। फ़िर इन विशालस्तरीय विविध आवश्यकताओं की पूर्ति हेतु औद्योगिक विस्तार ने गति पकड़ी। यह विस्तार अपने साथ कृषि क्रांति और नगरीकरण भी लाया किंतु यह विकास पूर्णरूपेण प्रकृति के सीमित संसाधनों के दोहन पर निर्भर था। परिणामस्वरूप, दिन - प्रतिदिन पर्यावरण पर दबाव बढ़ता ही गया।

अर्धशताब्दी पहले के काल से तुलना करें तो भारत की जनसंख्या में त्रिगुणात्मक स्तरीय वृद्धि होने के पश्चात् भी कृषि भूमि मात्र 20 प्रतिशत ही बढ़ पाई वह भी अनेक चारागाहों और जंगलों की भेंट चढ़ने के बाद। इससे न सिर्फ़ ज़मीन पर निरंतर दबाव बढ़ रहा है अपितु वनों की सफ़ाई के कारण मृदाक्षरण भी एक विषम समस्या बन कर उभर रहा है।

सन् 1950 में 32.2 मिलियन टन कोयले की वार्षिक खपत सन् 2000 आते-आते 313.70 मिलियन टन तक पहुँच गई। वहीं दूसरी ओर पेट्रोलियम की वार्षिक खपत भी सन् 1950 में 3.3 मिलियन टन से उछल कर सन् 2000 आते-आते 95.6 मिलियन टन पहुँच गई थी। जीवाश्म ईंधन के धुआँधार उपयोग ने न सिर्फ़ इनकी सीमित मात्रा को और न्यून-स्तरीय स्थिति तक पहुँचा दिया अपितु इनके ज्वलनोपरांत उत्सर्जित होने वाली गैसों ने एक नई विश्वव्यापी विषम समस्या को जन्म दिया - भूमण्डलीय ऊष्मन अथवा ग्लोबल वार्मिंग। जिस कारणवश, आज पूरी पृथ्वी ऊष्मा से तप्त है, संतप्त है। इस अवांछनीय ऊष्मा से न सिर्फ़ अवांछनीय जलवायु परिवर्तन देखने में आता है अपितु कई अन्य परेशानियों से दो-चार होना पड़ता है। बढ़ती आबादी जन - संसाधन

के लिए वन - संसाधन को ताक पर रख रही है। वनों का सफ़ाया करके वहाँ मानवीय वीथिकाओं का निर्माण जैव - विविधता के लिए एक बड़ा संकट है। आए दिन वन जंतुओं का मानवीय सीमाओं में प्रवेश वास्तव में हमारा उनकी गृह-स्थली पर अतिक्रमण का परिणाम है। वे हमारे नहीं अपितु हम उनके प्राकृतिक स्थान में हस्तक्षेप कर रहे हैं।

आधुनिक आबादी की आधुनिक आवश्यकताओं की पूर्ति हेतु अधिक ऊर्जा चाहिए और ऊर्जा उत्पादन की प्रक्रियाएँ ऊर्जा के साथ-साथ प्रदूषण और प्राकृतिक क्षति की निमित्त भी बनती हैं। इस बढ़ती आबादी पर विराम लगाने के साथ-साथ पर्यावरण हितैषी ऊर्जोत्पादक स्रोतों को बढ़ावा देना सहायक सिद्ध हो सकता है । जैसे सौर ऊर्जा, पवन ऊर्जा, भू-तापीय ऊर्जा आदि।

बढ़ती जनसंख्या की बढ़ती प्यास के कारण आजकल भूमिगत जल स्रोतों का अंधाधुंध शोषण हो रहा है। जिसकी आवश्यक भरपाई प्राकृतिक रूप से नहीं हो पा रही है। स्वच्छ जल के सीमित स्रोतों से सिमटती यह धरती सुखद भविष्य की ओर इशारा नहीं करती। वहीं इतने सारे उदरों की बुभुक्षा आज कृषि - क्षेत्र पर भयंकर दबाव डाल रही है। जिस कारण खाद्यान्न-पूर्ति के विशाल लक्ष्य की प्राप्ति हेतु विषैले रसायनों का अनियंत्रित रूप से प्रयोग किया जा रहा है। ये घातक रसायन, पर्यावरण व हमारे स्वास्थ्य को अनेक प्रकार से हानि पहुँचाते हैं।

बढ़ती जनसंख्या देश की आर्थिक स्थिति को असंतुलित कर, अनेक प्रकार के राष्ट्र - स्तरीय संघर्षों को उत्पन्न करती है। ऐसे में पर्यावरणोपयोगी नीतियों का क्रियान्वयन असंभव-सा हो जाता है। मात्र प्रशासन से आशा रख, हाथ पर हाथ धर कर बैठने से कुछ नहीं हो सकता। प्रकृति संरक्षण की दिशा में उपयुक्त कदम हर किसी को निजी स्तर पर उठाने होंगे अन्यथा यह सुरसा के मुख समान निरंतर बढ़ती जनसंख्या सब कुछ खत्म कर डालेगी। पर्यावरण संरक्षण के सभी पहलुओं पर उचित कदम उठाएँ जाएँ परंतु जनसंख्या वृद्धि को किसी भी स्थिति में उपेक्षित न किया जाए। यह एक समस्या हमारे सभी सुप्रयासों पर पानी फ़ेर सकती है। फ़िर किस प्रकार हम संधृत विकास की उस परिकल्पना को साकार कर पाएँगे जिसका विचार ब्रंटलैण्ड ने इस दुनिया को दिया था, जिसके अनुसार, प्राकृतिक संसाधन पूर्वजों से प्राप्त विरासत नहीं बल्कि हमारे पास अपनी संततियों की धरोहर है । बढ़ती जनसंख्या इस लक्ष्य प्राप्ति में सर्वप्रमुख बाधिका है। अतः पर्यावरण - संरक्षण के ज्ञान सहित परिवार-नियोजन जैसे विषय का अंतर्ग्रन्थित परिचय प्रदान करना भी हमारी वसुधा के कल्याणार्थ प्रमुख कदम बनकर उभर सकता है। अतः जनसंख्या को नियंत्रण कर हम एक सुंदर भविष्य की संकल्पना को साकार कर सकते हैं।

हरित-काव्य

पावस का राग

पावस की सुन्दर श्याम घटा
धरती की निरखे काम छटा
मुस्कान तड़ित की रही बिखर
जगमगा उठा सारा अम्बर

झड़-झड़-झड़-झड़ पड़ती फुहार
धरती का भींगा आर-पार
फिर फूटे अगणित अंकुर
ज्यों हों प्रमाण स्नेह के मधुर

दादुर झींगुर के सरस गान
सोहर की जैसी मधुर तान
खेतों के भू का सब्ज रूप
उस पर सूरज की बिछी धूप

धरती का यह उत्सवी रंग
बज रहा नदी में जल तरंग
शीतल पछिया के प्यार संग
हुलसे नवजीवन का उमंग

बादल का कैसा तीव्र प्यार
कर रही धरा सोलह सिंगार
यह मिलन सृष्टि का मूल स्रोत
उल्लसित राग से ओत-प्रोत।

तेजांशु कुमार
(बी.ए. हिंदी प्रतिष्ठा 19/3609)

हरित-काव्य

प्रकृति-संरक्षण

हरित - हरित हरियाली देखो
हरती है आँखों की पीड़ा।
काले - काले भ्रमर हैं करते
आपस में मिलकर गुंजन क्रीड़ा।।

भास्कर के परम तेज से
खिल उठे हैं सुंदर सुमन।
जो सुगंध मिश्रित पवन फ़ैलाकर
करते हैं मादक तन - मन।।

सूर्य - किरण ओस की बूँदों को
मोती की तरह चमकाती है।
मंद वायु सर - सर सी बहकर
पत्तों की पायल खड़काती है।।

सर्प - सरीखी चलती नदिया
प्रकृति का अंचल भिगोए।
बढ़ती जाती अपने पथ पर
सिंधु - मिलन का स्वप्न सँजोए।।

इस स्वार्थ से परिपूर्ण जगत में
जहाँ विचरती कपट की काया।
धन्य हैं ये उपकारी वृक्ष
जो स्वयं तप कर करते पर - छाया।।

पर आधुनिकता की अंध दौड़ में
मानव के कर्म हो गए हैं अनुचित।
जिस कारण प्रकृति का सौंदर्य
रह गया ग्राम सीमाओं तक संकुचित।।

भूमि, ध्वनि, जलहोयावायु,
प्रदूषण सब में फ़ैल चुका है।
पर्यावरण का मन रह देखकर
अंतः करण से दहल चुका है।।

प्रकृति के नियमों से खेलकर
मानव करेगा यदि उन्हें खंडित।
तो उसे सही मार्ग दिखाने के लिए
प्रकृति भी करेगी उसको दंडित।।

यदि मनुज अज्ञानतावश,
इसी तरह अड़ जाएगा।
तो हम सब का जीवन अस्तित्व,
संकट में पड़ जाएगा।।

प्रदूषक तत्त्वों का बहिष्कार करें,
पशुओं को न पहुँचाएँ हानि।
धरती को बनाएँ पुनःपवित्र,
न किकरें अपनी मनमानी।।

दानव नहीं मानव बनकर
आओ थोड़ी मनुष्यता दिखाएँ।
प्राणदात्री प्रकृति के संरक्षण का पाठ
हम मिलकर सबको पढ़ाएँ।।

— **आदित्य सिद्धार्थ**
(बी.ए. प्रोग्राम 17/4261)

बंगाल में चावल की मूल प्रजातियों का संरक्षण: एक पहल

(आनंद कुमार यादव)
(बी.ए. प्रोग्राम 19/2082)

चावल भारत के, विशेषतः बंगाल के, मुख्य भोज्य पदार्थों में से एक है तथा भारत में चावल का सर्वाधिक उत्पादन पश्चिम बंगाल में होता है। यहाँ पानी की प्रचुर उपलब्धता और भौगोलिक स्थिति चावल की उत्पादकता बढ़ाने के लिए अनुकूल है। यह महत्वपूर्ण भोज्य पदार्थ होने के साथ-साथ जीवन के हर चरणों से जुड़ा हुआ है, जिसकी शुरुआत मुखे भात (अन्नप्राशन) से होती है और दिवंगत आत्मा को दी जाने वाली भेट के साथ समाप्त होती है।

स्वतंत्रता के पश्चात खाद्यान्न की उत्पादकता बढ़ाने हेतु हरित क्रांति की शुरुआत की गई, जिसके फलस्वरूप खाद्यान्न उत्पादन में भारत आत्मनिर्भर बन सका। परंतु दीर्घकाल में हमे हरित क्रांति के अनेक सामाजिक-आर्थिक-स्वास्थ तथा पर्यावरण संबंधी दुष्परिणाम देखने को मिले। प्रयोगशाला में तैयार किए गए अनुवांशिक रूप से उन्नत बीजों (जेनेटिकली मोडिफाईड क्रॉप्स) का अत्यधिक प्रचलन एवं प्रयोग हरित क्रांति के दौर में हुआ। तत्कालिक रूप से उत्पादकता तो बढ़ी परंतु हम बीजों की मूल व स्वदेशी प्रजातियों से दूर हो गए, जो हमारी मृदा एवं जलवायु के लिए सर्वाधिक अनुकूल थे। यह बीज प्राकृतिक नहीं होते है अतः यह पूरी तरह से हमारे शरीर के लिए लाभदायक भी नहीं हो सकते है। लंबे समय तक अगर हम इसका उपयोग करे तो धीरे-धीरे यह कई गंभीर बीमारियों को आमंत्रित करते हैं। इसके विपरीत पारंपरिक बीजों के ऐसे कोई भी दुष्प्रभाव नहीं है क्योंकि वह पूर्ण रूप से प्राकृतिक है।

एक समय धान का कटोरा कहे जाने वाले पश्चिम बंगाल में भी हरित क्रांति के दौरान कई पारंपरिक चावल की किस्में विलुप्त हो गई। वर्ष 1975 में 5000 से अधिक पारंपरिक चावल की किस्मों की कृषि होती थी लेकिन आज बंगाल में 500 से भी कम चावल की किस्में बची हैं।

धीरे-धीरे विलुप्त हो रहे पारंपरिक बीजों को बचाने के लिए डॉ अंजन कुमार सिन्हा ने पश्चिम बंगाल के बाकुंरा जिले के अंतर्गत रणबहल गाँव के किसानों में इसकी जागरूकता बढ़ाने हेतु प्रयास कर रहे है। गाँव के किसानों ने भी इस बात को समझा और डॉ अंजन के नेतृत्व में 'अमरकानन ग्रामीण सामाजिक पर्यावरण कल्याण सोसाइटी' का निर्माण किया। इस सोसाइटी का मूल उद्देश्य पारंपरिक चावल की किस्मों की कृषि करना, बीजों को संरक्षित करना एवं दूसरों किसानों को इस विषय में जागरूक बनाना और पारंपरिक कृषि के लिए प्रेरित करना है।

इस सोसायटी के सदस्य पारंपरिक चावल के बीजों की संख्या में बढ़ोतरी के लिए प्राकृतिक वातावरण में इसकी खेती करते हैं। बीजों को मिट्टी के बरतनों में नीम के पत्तों के साथ रखा

जाता है। साथ ही यह बीज बैंक भी चलाते है जिसमें वह किसानों को मुफ्त में बीज वितरित करते हैं ताकि पारंपरिक चावल की खेती को बढ़ावा मिले। उपभोक्ता जागरूकता को बढ़ाने के लिए यह किसान कृषि मेले में अपनी पैदावार के साथ भाग लेते हैं और वहां पर लोगों को इसके महत्व और इतिहास के बारे में जानकारी भी देते हैं। साथ ही यह कई प्रख्यात विश्वविद्यालयों (जैसे कि विश्व-भारती विश्वविद्यालय, बिधानचंद्र कृषि विद्यालय, बर्दवान विश्वविद्यालय इत्यादि) के साथ स्वदेशी कृषि पद्धति को साझा करते हैं। इस तरह पारंपरिक कृषि को बरकरार रखने में यह संस्था एक महत्वपूर्ण योगदान दे रही है। केंद्रीय कृषि और किसान कल्याण मंत्री श्री नरेन्द्र सिंह तोमर ने इन प्रयासों को सराहा और उन्हें भारतीय कृषि अनुसंधान परिषद के 'पादप जीनोम संरक्षक समुदाय पुरस्कार' से सम्मानित किया और उन्हें 10 लाख रूपये की अनुदान राशि प्रदान की जिससे वह अपने इस बीज संरक्षण कार्य को गति प्रदान कर सके और इसकी जागरूकता पूरे राज्य के किसानों तक पहुंचा सके।

अब अनाजों के मात्रा के साथ-साथ उनमें पोषण गुणवत्ता बढ़ाने की आवश्यकता है। यह तभी संभव होगा जब हम इन पारंपरिक अनाजों के किस्मों को उपयोग में लाकर अपने भोजन में शामिल करेगें। तब हम हरित क्रांति द्वितीय की तरफ़ अर्थात पारंपरिक कृषि पद्धति की ओर लौट सकेंगे।

वन्यजीव संरक्षण

(श्रेया ठाकुर)
(बी.ए. प्रोग्राम 19/2141)

"क्रीड़ा करता हुआ वन्यजीव शावक राष्ट्र की प्रगति का जीवित प्रतीक है"

प्रकृति भारतवर्ष पर अपना स्नेह सदैव लुटाती रही है, यही कारण हैं कि विश्व के कुल प्राणी जगत का 7% और वनस्पति जगत का 11% हमारे समृद्धशाली देश में ही अवस्थित है। परंतु, विगत शताब्दी के दौरान पारिस्थिकी तंत्र पर प्रतिकूल मानवीय प्रभावों के दुष्परिणामस्वरूप भारत में वनस्पतियों की 10% और स्तनधारी जीवों की 20% प्रजातियां विलुप्तता की कगार पर है, जो मानव जीवन के लिये अत्यंत गंभीर और चुनौतीपूर्ण समस्या है।

भारतीय प्राणी विज्ञान सर्वेक्षण के अनुसार जिन क्षेत्रों में वन्यजीवों की 30% प्रजातियों का अंत हुआ वही जनसंख्या में उत्तरोत्तर वृद्धि हो रही हैं। इस शोध अध्ययन से स्पष्ट होता है कि अब तक धरती पर इतने व्यापक स्तर पर जीवों की प्रजातियों के नष्ट होने के पीछे मनुष्य ही एकमात्र कारण रहा है। इसलिए 'जो देश अपने भविष्य को सँवारना और सुधारना चाहता है उसे अपने वनों एवं वन्यजीवों का भली प्रकार से ध्यान रखना चाहिये। 'जैविक संतुलन को जड़ चेतन में ऊर्जा चेतना तथा गति प्रदान करने वाला एवं नव सृजन का उत्प्रेरक माना गया है। वन्यजीवों व वनस्पतियों के प्रति लोगों की जागरूकता बढ़ाने के उद्देश्य से 20 दिसंबर 2013 को यह निर्णय लिया गया कि प्रत्येक वर्ष 3 मार्च 'विश्व वन्यजीव दिवस' के रूप में मनाया जाएगा।

निरंतर देश की बढ़ती जनसंख्या की आवश्यकताओं की पूर्ति व विकास हेतु पारिस्थितिक तन्त्र का ह्रास होता जा रहा है। आधुनिक उत्पादन और उपभोग एवं अधिकतम धनार्जन की लालसा लिये हुए मनुष्य पृथ्वी के वन-पर्वतों तथा वन्यजीवों को नष्ट कर रहा है। जिसके कारण जीव-जन्तुओं का पुनर्जनन प्रभावित होता हैं। वर्तमान समय में जीन-रूपान्तरित बीजों के प्रयोग का प्रचलन बढ़ता जा रहा हैं। इनसे उत्पन्न फसलों को आहार बनाकर वन्यजीव अपनी प्रजनन क्षमता खो देते हैं। कृषि कार्यों में प्रयोग किये जाने वाले कीटनाशकों के दुष्परिणाम-स्वरूप भारी संख्या में पक्षु-पक्षी मारे जाते हैं और उनकों विलुप्तप्राय या संकटग्रस्त प्रजातियों की श्रेणी में स्थान दे दिया जाता हैं। आक्रमणकारी विदेशी प्रजातियों द्वारा कमजोर स्थानीय प्रजातियों को भोजन बनाए जाने से भी विशेष प्रजातियों की संख्या में कमी आने लगी है। गैर-नियोजित तरीके से चलाई गई परियोजनाओं के कारण भी जैव-विविधता में ह्रास निरंतर देखा जा रहा हैं। अनेक प्रजातियां, उभयचर, स्तनधारी पशुओं, सुप्रसिद्ध साइवेरियन पक्षियों एवं अकेशरुकी जन्तुओं

का जीवन संकटग्रस्त है। विलुप्तप्राय गंगा डॉल्फिन को 'राष्ट्रीय जलीय जीव' घोषित किया गया है। वन्यजीवों एवं जलीय जंतुओं पर मानवीय अतिक्रमण के कारण इस दुर्लभ जीव की संख्या जैविक संतुलन के लिए अपर्याप्त है। ये सब न केवल मानव जीवन और सृष्टि पर पड़ने वाले हानिकारक विनाशक परिणामों की ओर संकेत करते हैं अपितु पर्यावरण को प्रदूषित करने की अपेक्षा उसे संरक्षित एवं संवर्धित करने के लिए प्रेरित करते है।

भारत में संकटग्रस्त प्रजातियों के संरक्षण के लिए मुख्य रूप से दो उपाय प्रयोग में लाए जाते हैं यथास्थल संरक्षण एवं बहिस्थल संरक्षण। यथास्थल संरक्षण के अंतर्गत राष्ट्रीय पार्क और अभयारण्य का तन्त्र बनाकर निर्जन क्षेत्र का एक पर्याप्त भाग संरक्षित क्षेत्र के रूप में पृथक कर दिया जाता है। यह प्रजातियों के संरक्षण की सर्वश्रेष्ठ विधि है, किंतु विलुप्तता के अंतिम सोपान पर पहुंची संकटग्रस्त प्रजातियों के संरक्षण हेतु बहिस्थल संरक्षण के अंतर्गत उन्हें प्राकृतिक आवास से बाहर विशेष रूप से संरक्षित किया जाता है, जहाँ कृत्रिम रूप से बनाई गई दशाओं में उनकी संख्या वृद्धि का लक्ष्य रखा जाता हैं। संकटग्रस्त प्रजातियों की रक्षा, शिकार प्रबंधन, वन्यजीव आवास पर कानूनी रक्षण तथा वन्यजीवों के व्यापार पर रोक लगाने हेतु भारत में 104 राष्ट्रीय उद्यान, 553 वन्यजीव अभयारण्य, 18 बायोस्फीयर रिर्जव तथा 163 सामुदायिक रिर्जव सम्मिलित है। वन्यजीव संरक्षण को ध्यान में रखते हुए वर्ष 2005 में राष्ट्रीय बाघ संरक्षण प्राधिकरण का गठन किया गया, जिसका उद्देश्य अभयारण्य प्रबंधन में संख्यात्मक मानकों को सुनिश्चित करने के साथ-साथ बाघ संरक्षण को सुदृढ़ करना हैं। केंद्र व राज्य सरकारों के वन्यजीव संरक्षण के साथ-साथ देश के नागरिकों का भी यह कर्तव्य बनता है कि वे यहाँ रहने वाले जीव जंतुओं के जीवन की रक्षा करने में सहयोगी बने। वेदों में भी प्राकृतिक तत्वों से अनावश्यक और अमर्यादित छेड़छाड़ करने के दुष्परिणामों की ओर संकेत किया गया हैं तथा मानव को सीख भी दी गई हैं कि पर्यावरण संतुलन को नष्ट करने के दुष्परिणाम समस्त सृष्टि के लिए हानिकारक होंगे। इसलिए मनुष्य को सावधान रहना होगा कि हमारे अनुसंधान और पृथ्वी को क्षत-विक्षत करने के कारण प्राकृतिक मर्मस्थलों को चोट न पहुंचे।

वनस्पति एवं वन्यजीव जैवविविधता के अनमोल स्रोत है। प्रकृति अपने समस्त अवयवों के संग समायोजनपूर्वक क्रियाशील रहकर सम्पूर्ण जड़-चेतन को जीवनी शक्ति प्रदान करती है। सम्पूर्ण पर्यावरण प्रकृति आवरण ही है जो विलक्षण दैवीय शक्तियों से व्याप्त है, जिससे सृष्टि के समस्त जंगम एवं स्थातर प्राणी व वनस्पति को चेतना, उर्वरता एवं पुष्टि प्रदान करती है। अतः मनुष्य के लिए वन एवं वन्यजीव प्रकृति का ऐसा वास्तविक एवं लालित्यपूर्ण वरदान है जिसपर उसका अस्तित्व, उन्नति एवं समृद्धि निर्भर है। महात्मा गाँधी जी के शब्दों में "प्राकृतिक संसाधनों का असीमित उपभोग तथा अंतहीन वन्यजीव शोषण पर रोक सच्चे एवं सरल जीवन का नुस्खा है"।

ओजोन का घटता जोन

(आदित्यानन्द)
(B.A. Hindi Hons. 19/3646)

पर्यावरण शब्द सुनते ही अनेक प्रकार की चीजें स्वतः ही हमारे मस्तिष्क में आने लगती है। पर्यावरण अर्थात "हमारे चारों तरफ का वातावरण" हमारे आस पास, वनों आदि में विचरण करने वाले पशु-पक्षी, मनुष्य, पेड़ पौधे, मृदा, जल, विभिन्न प्रकार की गैस ये सभी हमारे पर्यावरण का एक अभिन्न अंग है। लेकिन विभिन्न कारणों से हमारा यह पर्यावरण आज प्रदूषित हो रहा है। जिसका दुष्प्रभाव इस पर्यावरण में सम्मिलित सभी चीजों पर पड़ रहा है।

हमारे पर्यावरण में एक विशेष प्रकार की गैस है जिसे 'ओजोन गैस' कहा जाता है। ओज़ोन ऑक्सीजन का ही एक प्रकार है और इसे O_3 के संकेत से प्रदर्शित करते है। यह गैस समताप मंडल में एक परत बनाती है जिसे हम ओजोन परत के नाम से जानते है।

ओजोन परत का विशेष कार्य यह है कि यह सूर्य से निकलने वाली पराबैंगनी किरणों को पृथ्वी तक पहुंचने से रोकती है। पराबैंगनी किरणें वास्तव में बहुत हानिकारक होती है इनसे त्वचा कैंसर, श्वसन तंत्र पर हानिकारक प्रभाव और अनुवांशिक क्षति होने की संभावना होती है। पृथ्वी पर जीवन सम्भव बनाने में इस ओजोन परत का विशिष्ट योगदान है

वर्तमान में इस ओजोन परत का क्षय हो रहा है जिसका कारण पर्यावरण में बढ़ता प्रदूषण है। यह प्रदूषण वास्तव में ओजोन परत को हल्का कर रहा है, जिसके कारण इस परत में छिद्र (छेद) की समस्या उत्पन्न हो रही है जहां से सूर्य की पराबैंगनी किरणें सीधे प्रवेश पाने में सक्षम है। ये छेद समय के साथ अपने आकार में वृद्धि कर रहे हैं और भविष्य की समस्याओं को निमंत्रण दे रहे हैं। वैश्विक तापमान में वृद्धि भी इसी समस्या से जुड़ा एक गम्भीर मुद्दा है। मानव निर्मित सीएफसी (क्लोरोफ्लोरोकार्बन) क्लोरीन, फ्लोरीन और कार्बन से बने अणु होते हैं जिनका उपयोग रेफ्रिजरेटर जैसे उत्पादों में प्रमुखता से हुआ है। सीएफसी के अणु वायुमंडल में टूट जाते हैं, और फिर क्लोरीन के सुक्ष्मतम् कणों को छोड़ते हैं जो ओज़ोन परत को तेजी से नष्ट करते है।

अगर हमने पर्यावरण प्रदूषण को जल्द से जल्द कम करने के लिए विशेष कदम नहीं उठाए अथवा इस समस्या को गंभीरता से नहीं लिया तो यह बात कहने में कोई हैरानी नहीं होनी चाहिए कि ओजोन क्षरण के दीर्घकालिक बुरे परिणाम देखने को मिल सकते हैं। वैसे संयुक्त राष्ट्र संघ से लेकर विभिन्न राष्ट्रीय और अंतर्राष्ट्रीय संस्थाएं इस समस्या के निवारण के लिए कई कड़े कदम उठा रही है।

इसके संदर्भ में एक अंतर्राष्ट्रीय संधि 16 सितम्बर 1987 में हुई जिसे मॉन्ट्रियल प्रोटोकॉल के नाम से जानते है। यह ओजोन परत को संरक्षित करने के लिए तथा एक निश्चित तरीके से उन पदार्थों का उत्सर्जन रोकने के लिए बनाई गई है, जिन्हें इसे अर्थात् ओजोन परत को नुकसान पहुंचाने के लिए उत्तरदायी माना जाता है। ओजोन संरक्षण के लिए यह एक महत्वपूर्ण प्रोटोकॉल हैं इसलिए प्रत्येक वर्ष 16 सितम्बर को विश्व ओजोन दिवस मनाया जाता है।

वियना संधि (कन्वेंशन)- यह ओजोन परत के संरक्षण के लिए एक बहुपक्षीय पर्यावरण समझौता है। इस पर 1985 के वियना सम्मेलन में सहमति बनी और 1988 में यह लागू किया गया। यह ओजोन परत की रक्षा के लिए अंतरराष्ट्रीय प्रयासों के लिए एक ढांचे के रूप में कार्य करता है। वहीं भारत में ओजोन परत संरक्षण से संबंधित विनियम और नियंत्रण, ओजोन हटाने वाले पदार्थ (विनियम और नियंत्रण) नियम, 2000 भी पर्यावरण संरक्षण अधिनियम, 1986 के तहत केंद्र सरकार द्वारा जारी किए गए हैं।

अगर ओजोन की वर्तमान स्थिति पर बात की जाए तो यह कहा जा सकता है कि इसे नुकसान पहुंचाने वाले तत्वों पर लगाई गई रोक के कारण पहले की तुलना में ओजोन छिद्रों में कुछ सुधार देखा जा सकता है। लेकिन इसका यह अर्थ कदापि नहीं निकालना चाहिए कि यह व्यापक संकट टल गया है। अतः हमें आने वाले भविष्य के लिए और सतर्क रहने की आवश्यकता है।

हमें यह सोचना होगा कि इस समस्या के प्रति हम कितना सजग हैं इससे निपटने के लिए हम तैयार है भी या नहीं। क्योंकि ऐसी समस्याएं हमें बहुत बड़ा नुकसान पहुंचा सकती हैं। ओजोन संरक्षण के प्रति जागरुकता फैलाने के लिए हमें स्कूल, कॉलेज और सामुदायिक स्तर पर वाद-विवाद आदि कार्यक्रमों का आयोजन करना चाहिए। सरकार द्वारा भी इसे लेकर अनेक कार्य किए जा रहे है जैसे कि ओजोन परत को नुकसान पहुंचाने वाले तत्वों पर प्रतिबंध लगाना, नए नियम कानून का निर्माण करना और हमारा भी यह कर्तव्य बनता है कि हम इन नियमों का पूरी तरह से पालन करें।

HUMANITY DIES

(Priyanshu Bhardwaj)
(B.A Prog. 19/2115)

God creates this earth with great pleasure and do you know which was his most favourite and lovable creation? -human. He gives equal rights to all creatures in nature but the mistake of the god is only that he had given excessive brain to human to just protect other creatures and nature from catastrophic conditions but human started using their brain cleverly and prove they are the sole masters of this planet. They cross their limits of selfishness. They forget about rest of the nature and its objects, only think of their own. Just because of this selfishness they start harming their mother nature.

Today I just want to draw your attention on HUMANITY- is it live or not? I think it's dead. I can prove with a most recent example: The country and the world woke up to the heart-breaking news from Kerala's Palakkad district's Silent Valley where a pregnant elephant succumbed to the inhumane injuries after reportedly eating pineapple stuffed with firecrackers, which exploded in her mouth and led to her death sometime after. The soon to be mother elephant died while trying to calm her searing pain while being inside the Velliyar river. I just want to ask one question to these fellow guys that it was lockdown period that's why we are so much attracted towards this news and shows our aggressions by posting aggressive posts on social media but guys do you know according to a report between

2014 to 2019 more than 510 elephants died all over India as a result of electrocution, train accidents, poaching, and poisoning. It's only about one creature think about many more species which has been extinct or going to be extinct.

The ironical part is that this type of incident is from Kerala state which has highest literacy rate, shame on this type of education, guys the ancient era was better than this particular era although they were not educated but they were not selfish, understand their rights and other creature's rights on resources provided by nature and live peacefully and happily but due to the expanding desires of greedy humans, we create a big distance between human and other creatures now they hate us and why they will love?

Because they want to be killed by us. We people can only put up our phones and post aggressive messages on social media, for a certain time we become emotional then after some time again everything becomes normal whenever something happens wrong we start doing the candle March, O' come on dears, just look around yourself and start spreading awareness around you

and your locality Otherwise nature never apologizes us now I have no more assumptions how much we fall to fulfil our Desires? We have another example of a tiger. Symbol of activeness and fastness whenever we work loosely our grandpa and grandma advised us to develop activeness like a tiger. They simply speak "*Chite ki Jaisi Chaal aur Baj ki jesi Najar honi chahie*" But what will happen when we tell our grandchildren to be active and start giving example of tiger like activeness? As I think up to that time, they will no longer exist in the world they will imagine just as today we imagine about dinosaurs. According to a report as many as 750 tigers have died in the country in the last eight years due to poaching and other causes with MP reporting the highest deaths at 173 according to an official data report.

Do you know about superstitions? Let me tell you about this, according to me this is the most disastrous belief. Superstition leads to the death of many animal species including one-horned rhino, deer leopards, elephants, Tiger, etc. Most of this type of cases are related to elite class people because they think the horn of Rhino is best for that particular circumstance, which they may face in future and spend a lot of money but I strongly ask a question to them that do you pay the life of that creature, think of yourself by putting you in the place of those animals.

This society is a kind of showing off type society. I can prove by giving example a lady from an elite class wants to wear ivory bangles in a function, definitely, she pays a huge amount, to purchase. O great lady, do you know the cost of the life of an elephant? Please don't just think of yourself start thinking about other creatures because nature is always known for its sudden and rapid change. We can't assume what happens when? So please stop showing off, stop believing in superstitions, live a simple and peaceful life and start love to the natural animals and stop proving your mentality of being masters of the entire planet, please stop.

MEASURES TO PROTECT NATURE AND WILDLIFE:

We have time to reform ourselves and our surroundings aware others by personal meetings, immediate texts to concerned authorities whenever such incidents are happening in your locality. If this time we cannot control our activities nature will never apologize to us. This is my humble request from you to just think of your upcoming generations and take an oath to protect our wildlife, our environment. This is also a request to concerned authorities to take some more strict actions against this type of cruelties otherwise we will face a serious situation in the future. guys we are future of our nation so as a future companion I want to suggest, just leave selfishness live with love and peace with nature and its objects they also have equal rights on this planet.

CORONA AND ENVIRONMENT – A CRITIQUE

(Priyanshu Bhardwaj)
(B.A. Prog. 19/2115)

Well said by a great person that isn't it sarcastic that a small virus did the work which the entire human race could not do. A number of institutions were formed to clean the environment. Much of the budget is declared to clean the environment but the entire work of these organizations and ministries is done by a small virus. Great job in my terms. It's not a joke, it's a hard fact which we all should have to accept.

Few days back, the place where they used to be a pile of garbage, today it is absolutely clean. Till yesterday, the city whose air was also difficult to breathe today the air of that city has also been purified. The factory from which their filth is used to be drained into the rivers and drains today that factories are closed.

And the rivers are flowing blossoming, saying that I wish the factory should be closed like this. Eternally with great happiness, it tells that now the aquatic organisms are also safe and play in my lap. The happiness is so big as we cannot compare their immense happiness even with the person who has secured the first position in the civil services examination.

Many aquatic organisms are also experiencing immense happiness due to the closure of these factories because now they can live peacefully and happily with their families. The need is to develop a mutual relationship and understanding with nature. Do you know, cure of each and every disease is present in jungles, but all of us want only think about the luxurious life. I just want to suggest that leave a one-day pleasure of your so-called box type houses or flats and spent some time with nature, definitely you will feel immense pleasure.

Some people have even claimed that for the first time in 30 years view of the Himalayas from Jalandhar is clearly visible. From this, we can estimate how much air pollution has decreased, not only air pollution but water pollution and noise pollution also have declined so I am not wrong that Corona has done the work of environment cleaning. The ambient air quality of mega cities has improved significantly.

Corona has given us a message to remain clean, to keep our surroundings clean, to understand the flora, and to adopt them in our lives.

We all can do this too. Can we not stay clean? Can't we do regular yoga? Can we not abandon fried foods and eat the food of the environment? The Neem Giloy that we are praising today, we are consuming aloe vera today. Can't we make it a part of a daily routine? Can we not wash hands after applying any dirt? We can do everything. Only need is to recognize the environment.

We all can reduce the use of our vehicles, as the government provides us buses, trains, metro to travel in public places, this will reduce pollution. We can also do the plantation work around the factories or Industries before the construction of these and at the same time we can leave the dirty water coming out of it in the sewage treatment plants first and then leave it in the rivers, there will be no pollution this will also cause no harms to aquatic creatures and it also leads to peace and harmony in nature.

COVID-19 AND WASTE MISMANAGEMENT

(Khushbu Chauhan)
(Pol. Sci Hons. 18/1681)

The author of the book 'The Great Leveller', Walter Scheidel argues that throughout human history, there have been four types of catastrophic events that led to greater economic equality: pandemic, war, revolution and state collapse. And in the current scenario, the world is facing the coronavirus crisis, a pandemic that has halted life for millions of people and is leveller in terms that either rich or poor the disease can hit anyone.

Though the context is different, however in fighting this pandemic every human has become incompetent belonging to any country. But just like other deadly diseases, humans have encountered in the past, COVID -19 is also a repercussion of destructive human activities.

This health emergency has compelled people of every status to stay at home in lockdowns, maintain social distancing, work from home and self-quarantine. The pandemic has affected the lives of people not only economically, socially and psychologically but also environmentally.

Usage of masks, gloves, PPEs (Personal Protection Equipment), sanitizers have become a new necessity over the globe contributing to the predominant problem of plastic pollution and Solid waste management. Immoderate increase in medical health care services due to the ginormous number of coronavirus cases daily leads to excessive generation of Biomedical waste.

Wuhan, the COVID-19 epicentre of China, experienced a massive increase in medical waste from between 40 and 50 tons/day before the outbreak to about 247 tons on 1 March.

According to ACS Publications' Environmental Science & Technology journal monthly estimated use of 129 billion face masks and 65 billion gloves globally is becoming a reason for environmental contamination. Although due to less traffic our skies are clear and free of pollution, however plastic consumption is still rising because of low price and easy availability.

As a large no. of people are at homes in lockdown, hence there is also an increase in household waste. In fear of catching the disease and anxiety due to various factors, people are preferring more and more online shopping which again comes with lots of hard plastic packaging. The COVID-19 pandemic has revealed vulnerabilities not only to growing plastic pollution but also in waste management chains, which could increase environmental pollution.

The dense population has also become one of the reasons for excess waste production and an increase in infection, as different survival time of viruses on different surfaces has made it more difficult for waste collectors to not get infected. And if not disposed of correctly, the waste may work as a vector for SARS-CoV-2. These large amounts of waste require collection and recycling both of which are jeopardized as a result of manpower shortage and efforts to infection control measures. Though the World Health Organisation has provided guidelines for waste management during SARS-CoV-2, however, this is still not ample for underdeveloped and developing countries where masses are uneducated and implementation is weak due to various social-economic factors and tons of waste either end up in landfills or rivers opening doors for other complications.

Whilst it is understandably difficult to contemplate other adverse consequences in the midst of this pandemic, it is vital to remember that there is another major challenge that threatens human prosperity-climate change. According to various Scientific Historians, COVID-19 could well be nature's warning against climate change because microbes are the first to ring an alarm and this could just be the first wave of the pandemic with bigger outbreaks. The first and the basic solution for all these problems would be prevention and it is possible through preserving and maintaining rich biodiversity as more species means fewer diseases. Many studies have shown that by breaking down the natural barriers between species destroying biodiversity humans have made way for more deadly viruses and pathogens to come in future.

To conclude, there is an immediate need to analyse the economic, environmental and social feasibility of integrating alternative approaches with existing Solid Waste Management systems during public health emergencies like these. And world governments on their part to provide ground-level solutions should make common people aware of such problems and encourage them to recycle and reduce their household waste and encourage them to use alternatives over single-use plastic.

As the lockdown or other restrictive measures are progressively lifted, a second phase is starting and new challenges are appearing. Adaptation is needed once more, this time to search for stabilized operation.

PROJECT DOLPHIN

(Hardik Arora)
(B.A. Prog. 18/236)

From the ramparts of the Red Fort on Independence Day, the Prime Minister announced 'Project Gangetic Dolphin' for the conservation of aforementioned riverine endangered species in India. The announcement of the project was extremely significant as the population of the species was under constant threat from a myriad of reasons.

Ganges River Dolphin *Platanista gangetica* is a mammal known as an indicator species that determine the health of the Ganga river ecosystem. These River dolphins are found in some of the mightiest rivers, including the Ganges, Indus, Yangtze, and Amazon. In India, the Ganges River Dolphin is primarily found in the Ganges and Brahmaputra Rivers and their tributaries in India, Bangladesh, and Nepal. One can sight these beautiful dolphins along deep river reaches in Assam, Bihar, Jharkhand, Madhya Pradesh, Rajasthan, Uttar Pradesh, and West Bengal. These Dolphins are generally blind and catch their prey by emitting an ultrasonic sound which reaches the prey.

India has included the species in Schedule 1 of the Wildlife Act, 1972. UCN has classified the species as Endangered and its listed in Appendix 1 of CITES. Project Dolphin will be a 10-year project and follows the conservation projects of recognition given to the conservation of tigers, under Project Tiger, and elephants, under Project Elephant, in Indian animal conservation history. “Project Dolphin” will be cleared to enhance the population of these dolphins.

According to the World Wildlife Fund, Gangetic river dolphins were officially and scientifically discovered by Roxburgh. At that time, it gave an estimate of 5000-6000 dolphins in Ganga-Brahmaputra-Meghna and Karnaphuli river systems and its tributaries of Nepal, India, Bhutan, and Bangladesh, between the foothills of the Himalayas and the tidal zones.

In the present scenario, WWF says that due to the continuing threat from many sources, the population of dolphins has declined to 1800. It has already become extinct from most of its earlier distribution ranges and even in its present-day distribution ranges the density of this animal is decreasing. Major Threats that cause harm to the dolphin population are Water development projects, fragmentation of pop, dams, barrages, several pollutants load, deliberate killing, and mortality in fishing gear. Several Anthropological activities cause harm to the

species like pollution in river Ganga. Ganga is heavily polluted with 9000 tons of pesticides and 6 million tonnes of fertilizers used in the vicinity of the river each year. The chemicals that are released from Industries are harmful to the higher trophic animals in the food chain and Ganges river dolphin is a top predator and therefore sensitive to environmental perturbations. Increasing industrialization and human settlements in the catchment areas have led to habitat degradation of these dolphins. If these trends are continued and are not paid attention, then the population of the dolphins will be on the verge of extinction.

As it is an endemic and rare charismatic mega-fauna found only in the Indian subcontinent and an indicator species of the Ganga river ecosystem, it was crucial to take steps to prevent its extinction. It was also needed to preserve our natural aquatic heritage as these dolphins were declared as "National Aquatic Animal" in the year 2009. Preserving these species will also benefit the Ganga river ecosystem as these are ecological indicators and they point at the healthy river ecosystems. While launching the project the prime minister said that the project will focus on both river and sea dolphins, and "strengthen biodiversity, create employment opportunities and attract tourism".

As India has demonstrated her prowess and soft power in the world by the splendid success of PROJECT TIGER and I am very sure that our environmentalists and scientists will be able to protect these water friendly mammals by adopting modern technology. The role of mainstream populations like fishermen and other river and ocean dependent populations will also have a crucial role to play in the success of our aim. Student's community also has an invaluable role in this project and instead of thinking of this project as government duty we should also think of this as our own aim. We can use the power of the internet for mass appeal to people for the conservation of various animals.

At last, the success of the programme will depend upon the implementation policy and how various communities will come forward towards the common goal.

WOMEN AS CLEAN-ENERGY ENTREPRENEURS

(Parijat)
(B. Com Hons. 18/1039)

In our world, Women currently account for around 32% of total employment in the renewable energy sector as compared to 22% in the traditional oil and gas sector. On the one hand, this tells us that women are generally under-represented in the energy sector, but on the other side, it shows that renewable energy sector is an opportunity for change. With energy-related greenhouse gas emissions at an incredible high pattern in 2019 and 800 million people still lacking access to energy, the world needs to keep moving towards cleaner energy options. Further increasing the gender diversity of the renewable energy sector will help societies to tap more innovative potential to drive this transition. Yet, barriers remain for women entering the renewable energy sector which needs to be addressed in order to increase participation.

1. Barriers to women in the renewable energy sector

Supporting women's access to this sector is important for gender parity and for economic, societal and environmental benefits. According to the International Monetary Fund, at a macroeconomic level, the productivity gains from narrowing gender gaps across the economy could increase GDP by 35%. Studies also reflect that increasing diversity of leadership teams improves the quality of innovation and financial performance of businesses.

Gender norms, social and cultural practices are amongst key barriers identified in IRENA's report, Renewable Energy: A Gender Perspective. There is an off-field perception that women are less suited to technical fields. In emerging economies, especially in rural contexts, there is little or no technical training for women or it is often discouraged at all. In general, fewer women than men will choose to go into STEM fields, though providing girls with better information on career opportunities and female role models can help to increase numbers. This may also translate into gender biased practices that women are ill suited to roles e.g. seeing physical strength as a barrier to installation work. The IRENA report also mentioned that lack of mentoring opportunities and low access to informal networks, inequalities among different income-group people and inflexible working hours, etc. are some of the barriers to career progression

Supporting more women to take on leadership roles and help them to become more dynamic, the renewable energy sector can help to create a continuous cycle for more women to enter the

sector and for organisations to be better adapted to women. In Thailand, for example, a female solar power pioneer Wander Khunchornyakong founded a solar power firm in 1993, which now owns 36 solar farm projects across the country and employs a workforce that is 60% female.

2. A central role for women in increasing access to clean energy

The rise of small-scale renewable energy generation and energy efficiency projects can give women a wonderful access in rural areas as well as an opportunity to act as energy-entrepreneurs and energy-users. In certain countries, where cultural norms limit interaction between genders, women can easily interact with female end-users, by entering households to install technology when male family members are not present. For example, Barefoot College works in emerging economies to break down male-female gender roles conspiracy and empower women to help their communities. They do this by teaching women from rural areas to design, install and maintain solar systems that provide electricity or hot water to their villages or towns.

Women solar energy entrepreneurs, interviewed by the IEA, faced the common challenge of convincing financial institutions to provide finance as well as creating networks and partnerships for their businesses. In emerging economies or the developing economies, women are often less financially independent than men, as on an average being less likely to own or actively use a bank account. On the demand side, female entrepreneurs have less knowledge of available business opportunities, credit facilities and bank services. Women are often at a disadvantage by having less capital to invest or collateral against which to borrow.

On one side, it should also be taken into account that be it any field, women can do wonders when they make themselves sure about anything and particularly, in renewable energy sector, there will be maximum number of participation and a thorough activity will take place by every woman who has the desire to work so.

International Day for the Preservation of the Ozone Layer

(Sourav Kumar)
(Pol. Sci. Hons. 19 / 3951)

"Earth without OZONE is sort of a house without a roof..."

This year 2020 marks 33rd birthday of the International protocol on 16th September which accounts for the preservation of Ozone Layer. The theme of this year celebrates over 3 decades of International cooperation of its protection.

Earth's Ozone Layer is a naturally occurring layer of gas that sits 15 to 30 KM above sea level. It protects life on earth from the destructive Ultraviolet B radiation (which can cause skin cancer, cataracts, snow blindness etc.) that the Sun emits. Ozone is a molecule of 3 oxygen atoms, highly reactive and is constantly being broken down and reformed again up in the stratosphere. Because of its beneficial role, stratospheric Ozone is considered as good but excess ozone at Earth's surface that is formed from pollutants is considered bad because it harms humans, plants and animals.

The first time an extreme depletion of Ozone layer called 'Ozone Hole' was identified over Antarctica in May 1985 by the British Antarctic survey article and it was clear that this drop in Ozone was due to artificially man-made chemicals called Chlorofluorocarbons.

Considering this threat, International treaty called **MONTREAL PROTOCOL** was signed on 16th September 1987, which sits under the Vienna Conventions of 1985, to protect the ozone layer by reducing the use of ozone depleting substances like CFCs used in refrigerators, aerosols, sterilant and carbon tetrachloride, foams, halons gases in fire extinguishers, large chillers, propellants ,blowing agents for making plastics foams, firefighting agents, solvents for dry cleaning and greasing, other chemical products etc. Atmospheric measurements have clearly demonstrated theoretical studies showing that chlorine and bromine released from hydrocarbons in the atmosphere deplete ozone. There are two main ingredients responsible for the destruction of Ozone layer namely Cold Temperatures and Sunlight. The Cold temperatures helps in the formation of clouds in stratosphere. Nothing happens with this clouds in the dark but when the South polar springs arrives in the mid of August and September, the UV radiations from the sun reaches the Antarctic circle and reacts with the clouds due to which a photochemical reaction of chlorine release starts and Ozone destruction takes place.

The study published by UN in 2018 stated that the Montreal protocol is working and chlorine level declined by 0.8% each year from 2005 due to worldwide ban on use of CFCs. The atmospheric concentrations of CFCs/Freons and related chlorinated hydrocarbons have either levelled off or decreased. Scientists believe that Ozone layer will fully recover by 2080 and recently ozone hole over Arctic in Northern Hemisphere has now healed completely mainly driven by an unusually strong and long-lived polar vortex, a pattern of swirling strong winds.

World Meteorological Organization (WMO) said in May,2020 "the massive Ozone hole over the Arctic region has now recovered which was biggest since 2011". But the recent satellite analytical study of NASA revealed that the suitable conditions for Ozone destruction shows its presence in the polar clouds formed by ice and nitric acid trihydrate (NAT), and there will be rapid growth of Ozone hole in the coming weeks.

So, the alarming bells are ringing because the holes can increase quickly by the long-lived CFCs in the atmosphere and even by Natural processes also!

Every year 16th September is celebrated as the International Day for the Preservation of Ozone Layer. We all should avoid the consumption of gases dangerous to the Ozone layer, stop using cleaning products harmful to environment, minimize our uses of cars, avoid old air conditioners and refrigerators etc. and most importantly understand the need of ensuring healthy people and a healthy planet.

"OZONE today ensure LIFE tomorrow"

RIVER POLLUTION

(Roshan Yadav)
(B.A. Pol. Sci. Hons. 19/3909)

In introduction of river pollution, we will see how rivers of World and India are getting dirty day by day due to various reasons like untreated sewage, oil spills etc. River pollution concern is increasing now because 70% of the earth is covered in water, yet only 3% of it is fresh. Of that 3%, 2.6 of it is locked away in glaciers and polar ice caps. Water Pollution is main Issue that we are facing, as more than 70% of the Earth's surface is water-covered. A 1992 World Health Organization study reported that out of India's 3,119 towns and cities, just 209 have partial sewage treatment facilities, only 8 have full wastewater treatment facilities. A 1995 report claimed 114 Indian cities were dumping untreated water used sewage and partially cremated bodies directly into the Ganges River. Lack of toilets and sanitation facilities causes open defection in rural and urban pill areas of India, like many developing countries. The largest source of water pollution in India is untreated sewage.

Other sources of pollution in river is agriculture runoff and unregulated small-scale industry. Most rivers, lakes and surface water in India are Polluted due to industries, untreated sewage and solid wastes. The uncollected waste accumulates in the urban areas causing unhygienic conditions and releasing pollutants that leach into surface and groundwater. Oil spill is also the major reason and problem of river pollution. An oil spill is the release of a liquid petroleum hydrocarbon into the environment, especially the marine ecosystem, due to human activity and is form of pollution.

The term is usually given to marine oil spills, where oil is released into the ocean or coastal waters, but spills may also occur on land. Oil spills may be due to release of crude oil from tankers, offshore platforms, drilling rigs and wells, as well as spills of refined petroleum products (such as gasoline, diesel) which make river dirty and disturb marine ecosystem. Agriculture is also playing major role in river pollution. Farmers put fertilizers and pesticides can be washed through the soil by rain, to end up rivers. Fertilizers and pesticides are harmful because they cause algae to grow. The algae then destroy water plants green algae. Factories use water from rivers to power machinery or to cool down machinery.

Effects of river pollution kills water plants and animals. Polluted water also carries diseases. When animal drinks the water they may get diseases, which can kill them. People can even get

diseases by eating the infected animal. This happens a lot in Africa. Example of food chain little fish eat tiny organic particles then big fishes eat tiny fishes then human also eat fish. Some of these water-borne diseases are typhoid, cholera, paratyphoid fever, dysentery, jaundice, amoebiasis and malaria. Chemicals in the water also have negative effect on our health. Pesticides – can damage the nervous system and cause because of the carbonates and organophosphates that they contain. Drinking untreated water nowadays and your body will immediately react to it. You will get a stomach ache at least. Water–borne diseases account of 3,575,000 people a year! That's equivalent to a jumbo jet crashing every hour, and the majority of these are children. Infectious diseases can be spread through contaminated water, chemicals, pesticides (can damage the nervous system and cause cancer because of the carbonates and organophosphates that they contain. Chlorine can cause reproductive and endocrinal damage). I have seen one lake named Sanjay lake in Mayur Vihar locality where there is so much dirt in lake but still people do fishing and there is green algae layer in lake which I was watching day by day lake was getting so much dirty and authority was doing nothing.

Following are the major actions which our government has taken in past years. In 1985, Congress government started a ganga action plan to clean the river ganga, which is considered sacred by millions of Indians. In 1995, the then central government started a national river conservation plan and a 'Yamuna action plan' to clean the river Yamuna. The simplest solution for water pollution prevention is to be responsible with any chemical use:

- Dispose of the leftover chemicals and container properly per the product instructions, or check with your local municipality.
- Do not apply near water systems such as wells, streams, lakes, or curb inlets/drains.

Various simple and implementable ways can be used to limit the pollution of our water resources. Further, following actions can be taken individually or collectively and must be done repeatedly to reduce the impacts on water systems.

- Practice responsible use of fertilizer, herbicides, and pesticides.
- Plant trees or any plants near bodies of water, do not make your toilet as your wastebasket, practice refuse, reduce, reuse, and recycle.

I believe we must respect our river and we need to focus on very serious issue of river pollution.

VANVASI DIARIES

TRADITIONAL TRIBAL PRACTICES FOR ENVIRONMENT CONSERVATION

(Smita Jha)
(B.A. Prog. 18/370)

India is a country known for its rich culture. The people of India have taken care of their country since ancient times to the modern time. In today's fast pacing world, the tribal people have taken it as their prime duty to conserve the nature. No one can look after their forest and environment better than ethnic (or tribal) people because their survival and identity depend on it. They are the best conservationists and they have managed their cultivable land for many generations. It has been noticed that these people know how to live with harmony in nature. There are many ways in which tribes and tribal people have taken care of the environment. Some of them are as follows:

Interdependence between Nature and People: Vanvasi have mostly resided within or around the periphery of jungles. This can be seen by their dominance in forest-covered areas of Central India. Vanvasi do not live a resource-intensive life; hence they do not depend on mining for their needs. They consider the forest as their "mother" and it is often personified in the form of a goddess.

Self-Sufficiency in Food and Farming: Despite the introduction of modern techniques in agriculture, many states and farmers suffer from low productivity. And the ones that produce a sufficient quantity use a heavy dosage of fertilizers and pesticides doing little good to human health. The traditional farming methods of Vanvasi have been successfully feeding their communities without the use of harmful substances.

Strong Sense of Collective Identity: We have a complex composition of different castes, sub-castes, cultures, religion etc. that form our social hierarchy. Needless to say, such bifurcations lead to conflicts among different groups of people resulting in mishaps. Perhaps we can learn a bit from the tribal culture on how to define identity. Collective identity of tribal people does not mean that they don't have classifications; rather they have a different set of measures that dictate the structure of their societal composition. A tribal society is characterized by cohesiveness, habitat, and stress on clan structures and ethnicity.

Ethno medicine: Indian pharmaceutical industry is worth 27 billion dollars and is the third largest in the world, by volume. Increasing diseases have led to an increase in the advancement

of medicines and technology to cure diseases. Ethno-medicine is the belief and practice relating to health and diseases, which are products of indigenous cultural knowledge of the particular community bonds, higher position of women, and a strong sense of identity. If we inculcate the use of this practice in our system of healthcare, minimizing the use of chemical-based medicines and choosing ethnic medicines can be a good alternative to the recurring diseases among masses.

Associating the Self with Nature's Elements: We know forests are sacred to Vanvasi and they have a co-existential relationship with nature. They associate their existence with land. This is not only because agriculture is their primary profession, but also, they think of nature as their "mother" i.e. a divine entity. The land is their pride.

Nature is personified in different tribal literatures as different beings. They have emotions. They measure happiness of the self in terms of nature. There are various tribal communities in India which are protecting and conserving the environment every day. Tribal people have also fought the government when it came to saving their habitat. For instance, the famous, Niyamgiri hills". This place is home to the Dongria Kondh Vanvasi who consider the hills called Niyam Dongar to be the abode of their divine god. Their habitat came into danger when Vedanta Aluminum Limited agreed to establish an aluminum refinery as a part of the industrial development in Odisha. Despite suspicions over the environmental impact of the project, the Supreme Court granted clearance to Vedanta in August 2008. The decision led to a mass movement by the Kondh community who marched into the streets of Bhubaneswar. After a long struggle against the government, the Kondh community won the battle in 2010 when the potential environmental violations by the company were exposed. The community was successful in preserving their home and nature.

Some tribes have used the environment in the best possible way, for instance the "Adis" of Siang, Arunachal Pradesh involve the use of herbs, plants and roots of some trees for healthcare. They have distinct ways of treating different diseases using a variety of herbal medicines. Their medicines are used to cure some common diseases such as fever, malaria, jaundice, etc. As per a report published in Science Direct, Natural Products Alert (NAPRALET) contains nearly 2500 species used in traditional medical system in India alone.

One example that depicts the devotion Vanvasi hold towards nature is that of the Gonds. They are the largest ethnic Adivasi community of India and add up to around 14 million people in total. Their principle god is the "Bada Dev" whom they consider as the creator of the universe.

He is believed to control life and death. In Gond culture, god resides in the Saja tree and this is why it is most sacred to the community. They ensure complete protection of the tree and use it for ceremonial purposes.

The traditional farming methods of Vanvasi have been successfully feeding their communities without the use of harmful substances. For example, Adivasi farmers in Dhaarav village of Madhya Pradesh practice the "utera" system. They save seeds from the previous harvest, sow several seeds at the same time, use animals to fertilize land and involve zero use of chemicals. In addition, mixed farming helps to recover the loss by failure of one crop.

Adivasi may be seen as a backward community today, but that is because the popular cultures involve living in an unsustainable manner.

Society looks down upon people who do not live a credit-based lifestyle, and living a life full of debt. Vanvasi shows us a far nobler way of life, one that does not extract mindlessly, treats the community members with respect, is rooted in ancestral plant-based knowledge and worships nature instead of decimating it. Aren't these the virtues worth celebrating?

TRIBAL TREASURES OF BHARAT

IRULA TRIBE: MORE THAN A SNAKE CATCHER

(Dr. Mayank Pandey)

Since time immemorial, Bharat is blessed to have a rich and diverse treasure of tribes (*Vanvasi*) which are distributed within the geographical terrains of the country. These tribes and tribal population are conserving the tribal languages, culture and vast traditional knowledge of herbs and biodiversity, a fraction of which has been explored and explained till date. One of the most important and oldest tribes in the country is **Irula** tribe.

People of Irula tribe are known as *Irular* which means 'dark complexion'. They speak Irula language which is a descendent of Dravidian language. They are also known as *Irulika* (Karnataka), *Irulan* (Tamil Nadu) and *Irulaas* (Kerala). Irula tribe is one of the largest and oldest tribes of southern India which was densely concentrated in Neelgiri hills but presently distributed mainly in Karnataka (Ramnagar etc.; population around sixteen thousand), Tamil Nadu (regions of Neelgiri, Thiruvallur, Kanchipuram, Selam, Chennai, Coimbatore etc.; population more than 2.5 lakh) and Kerala (Waynad, Idukki, etc.; population around twenty-five thousand).

Truly regarded as one of the last forest's scientists of the world, Irula tribe is blessed with exceptional and deep knowledge of herbal medicines, anti-snake's venom medicines, tracking and digging skills and to catch snakes (even the most venomous like Krait and Cobra). Irula women have deep knowledge of pregnancy and delivery Living deep into the jungles, Irulars were entirely dependent on the forest reserves and resources. Professionally, the Irular have been the hunters and snake catchers and used to sell the reptile's skin. However, when the Wildlife Protection Act, 1972 came into the existence, it became extremely difficult for them to arrange livelihood. It was ***Padma Shri* Romulus Whitaker**, the famous Indian herpetologist and conservationist, who closely observed the survival crisis of Irula people and formed **Irula Snake Catchers' Industrial Cooperative Society (ISCICS)** and **Irula Tribe Women's Welfare Society (ITWWS)** to rehabilitate the people and to conserve and utilize their traditional knowledge in the wildlife conservation.

Irula Snake Catchers' Industrial Cooperative Society (ISCICS): founded by Romulus Whitaker in 1978 at Chinglapet (45 km away from Chennai), the society is contributing in developing anti-venom medicines. The Irula members of the society catch the snakes and keep

in earthen pots. With the proper permission of the concerned forest and wildlife authority, safely take out their venom without harming the animal. The venom is sold to the prestigious laboratories and institutions (like Haffkine Institute etc.) doing research work on developing anti-venom, which save the lives of innumerable snake bites patients. This way, the traditional knowledge of Irular people is providing them the livelihood and saving millions of lives.

Irular catching the snake

Romulus Whitaker

(Sources:https://www.dailymail.co.uk/indiahome/indianews/article-3998268/The-snake-catching-tribe-saving-lives-India.html**;** https://en.wikipedia.org/wiki/Romulus_Whitaker**;** https://indiantribalheritage.org/?p=9428#gsc.tab=0**)**

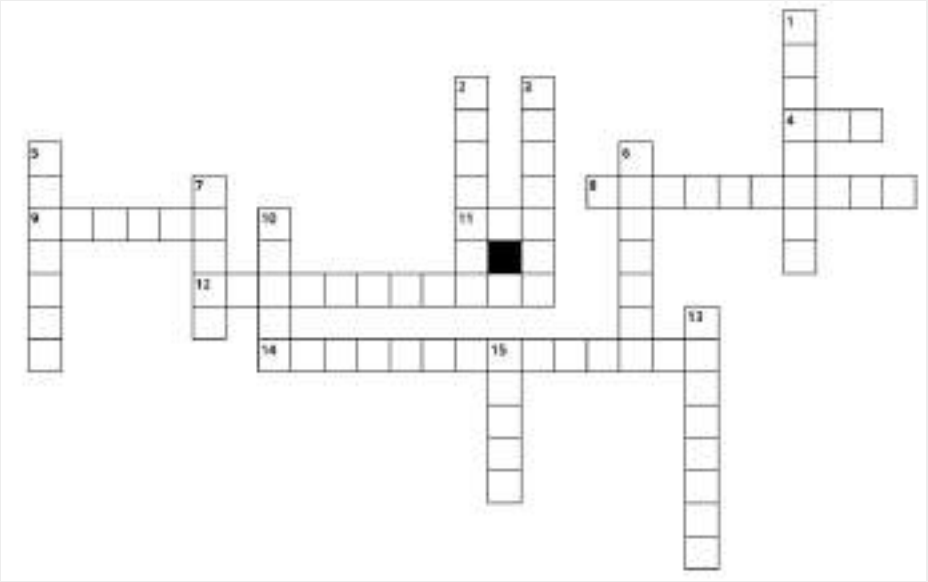
Irula Tribe Women's Welfare Society (ITWWS): The society was formed in 1986 with an objective to augment the living conditions of tribal girls and women of Irula community. The female members are engaged in documentation and marketing of herbal/medicinal knowledge, livelihood, development, afforestation programs and socio-economic empowerments of themselves.

Serving the global community: Using their exceptional skills of snake catching, Irula people are not only giving the wildlife services in the country but abroad also. Florida (USA) state administration wanted someone (or organization) to capture Burmese pythons from Key Largo and release them in natural habitat but failed to get expertise elsewhere. In January 2017, Masi Sadaiyan and Vadivel Gopal of Irula tribe were sent for the same job and both captured fourteen pythons in less than two weeks. The Florida administration paid $70000 for the job (source: Wikipedia).

Rituals and Practices: The tribe is devotee to Lord Shiva and Goddess Kaniamma. Child marriage was predominant in earlier times but this practice is slowly vanishing out. The unusual diets include raw or roasted termites and rats but now, as the Irula tribal population is joining the urban ecosystem, food habits are changing too. They are also working as laborers and coolies in the mills and agricultural fields.

Rehabilitation and Cooperation Programs: many socio-cultural organizations of the country are working hard for the formal education and skill development of the Irula people, so that the interested persons may earn the livelihood from other sources also. Also, due to exponential population growth and rapid urbanization, there is an unprecedented pressure on the forest cover and resources. This has directly and adversely affected the life and livelihood of the Irula tribe. Therefore, utmost attention, care and rehabilitation programs are needed for their betterment. This is the right and high time to conserve the tribe and their tribal practices which will in turn conserve the deep and vast traditional knowledge treasure of India.

Knowledge Checkpoint
(Crossword)



Across

4. Number of Biogeographic Zones of India

8. Chemical responsible for the decline of Vulture population in India

9. State animal of Delhi

11. Complex process required to be done before initiating a mega project to assess the reversible/irreversible loss to the environment

12. Ozone found at this layer is harmful

14. State of water pollution where algal bloom is developed over water body due to excess nutrient

Down

1. September 16, International Day for the preservation of Ozone layer commemorates the signing date of which protocol/convention

2. Gas leaked in Vizag Gas Tragedy

3. Greenhouse gas and a fuel

5. Loktak lake with floating islands is in which state

6. Community of western India known for its dedication towards toward Environment

7. Total number of Tiger Reserves in India

10. An important parameter of Air quality index (AQI)

13. *Prosopis juliflora* is an____species for the floral diversity of Delhi

15. Tribal Community from southern India, specialized in catching venomous snakes like cobra

(Answers given on the last page)

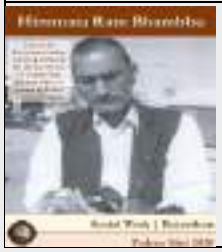
ENVIRONMENT CALENDAR (2020)

JANUARY	FEBRUARY	MARCH
5th: National Bird Day	2nd: World Wetland Day (RAMSAR Convention) 27th: International Polar Bear Day 28th: National Science Day	3rd: World Wildlife Day 20th: World Sparrow Day 21st: International Day of Forests; World Planting Day; World Wood Day 22nd: World Water & Sanitation Day 23rd: World Meteorological Day; World Resources Day 27th: Earth Hour (Last Saturday of March) (WWF)
APRIL	**MAY**	**JUNE**
7th: World Health Day 10th: World Atmosphere Day 22nd: Earth Day	3rd: International Energy Day 8th: World Migratory Bird Day 11th: National Technology Day 14th: Endemic Bird Day 22nd: International Day of Biological Diversity 23rd: World Turtle Day	5th: World Environment Day (Stockholm Conference) 7th: World Food Safety Day 8th: World Ocean Day 15th: Global Wind Day 17th: World Day to Combat Desertification and Drought
JULY	**AUGUST**	**SEPTEMBER**
1st – 7th: Van Mahotsav Week 10th: National Fish Farmer's Day of India 11th: World Population Day 26th: International Mangrove Day 29th: International Tiger Day	10th: World Lion Day; World Biofuel Day 12th: World Elephant Day 22nd: Honey Bee Day 23rd – 28th: World Water Week	8th: World Clean up Day 16th: International Day for the Preservation of Ozone Layer 18th: World Water Monitoring Day 21st: Zero Emissions Day 26th: World Environmental Health Day 27th: World Rivers Day (Fourth Sunday of September)
OCTOBER	**NOVEMBER**	**DECEMBER**
1st – 7th: Wildlife Week 3rd: World Nature Day, World Habitat Day 4th: World Animal Day 23rd: International Snow Leopard Day	6th: International Day for Preventing the Exploitation of the Environment in War and Armed Conflict 12th: World Birds Day 14th: World Energy Conservation Day 29th: International Jaguar Day	5th: World Soil Day 11th: International Mountain Day 14th: National Energy Conservation Day

Recent Developments

- **India's first biofuel-powered flight Spicejet on August 27, 2018**
- **Kochi Airport (Kerala): First airport in India fully running on solar power**
- **India's first e-waste clinic** is going to set up in **Bhopal**
- India has completely phased out **HCFC-141 b**, a potent Ozone Depleting Substance
- Fourth Cycle of the **All India Tiger Estimation 2018** has successfully made entry in the **Guinness Book of World Records (2020)** for using **World's Largest Camera Trapping Wildlife Survey.**
- CSIR-CMERI has established the W**orld's Largest Solar Tree** in Durgapur, West Bengal.
- **Golden Birdwing**, a Himalayan Butterfly, is the newly recorded largest butterfly of India
- **World Food Safety Day** is being observed since 2019. Collaborative initiative of WHO & FAO. Future of Food Safety
- **National Fish Farmer's Day** is observed every year on **July 10** (to commemorate scientists Dr. K.H. Alikunhi and Dr. H.L. Chaudhary who successfully demonstrated the **Hypophysation**- induced breeding of carps)
- **Andhra Pradesh Govt.** launched **India's first online Waste Exchange Program**, which is a real-time monitoring of hazardous waste movement in the state.
- **Kashmir Saffron** receives Geographical Indication (GI) tagging.
- **Mauritius Oil Spill:** Ship **M V Wakashio** struck a coral reef and an oil spill of over 1,000 tonnes occurred into the Indian Ocean. Two environmentally protected marine ecosystems and the Blue Bay Marine Park Reserve have been adversely affected.

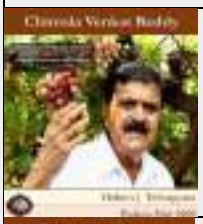
CIVILIAN AWARDS TO ENVIRONMENT CONSERVATIONISTS (2020)

	**Anil Prakash Joshi** Padma Shri – 2006 **Padma Bhushan – 2020** Himalayan Environmental Studies and Conservation Organization
	**Himmat Ram Bhambhu** **Padma Bhushan – 2020** Farmer and Environmentalist; planted more than lakh trees in Nagaur region (desert area of Rajasthan)

Tulsi Gowda
Padma Bhushan 2020
Known as Encyclopaedia of Forests as she carries vast and deep knowledge of forest resources, a tribal woman from Halakki Tribe in Karnataka. Also, a representative of rich traditional knowledge

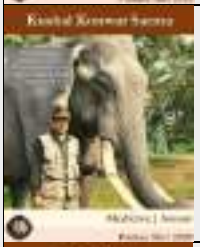
Rahibai Soma Popere
Padma Shri 2020
Known as 'Seed Mother', a self-taught tribal woman from Ahmednagar (Maharashtra). Contributing in conserving agro-biodiversity of India.

Kalyan Singh Rawat
Padma Shri 2020
Running the plantation drive for a long period in various regions of Uttarakhand. Founder of *Maiti* movement where a bride plants a tree at the time of her marriage.



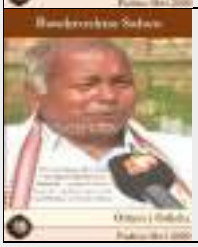
Chintala Venkat Reddy
Padma Shri 2020
Promoting organic farming in Telangana and branding the organic fruits. Developed new varieties of fruits.

Sundaram Verma
Padma Shri 2020
Farmer from arid Shekhawati region of Rajasthan, he has been propagating 'Dryland Agroforestry' which requires only one litre of water per tree. He has grown over 50000 trees using this technique.



Kushal Konwar Sarma
Padma Shri 2020
A veterinarian from Guwahati (Assam), who has devoted his life to the conservation of Asian Elephants.

Trinity Saioo
Padma Shri 2020
A tribal woman farmer from Jaintia Hills (Meghalaya), she initiated woman-led turmeric farming which is augmenting their living standard by increasing their livelihood three times.



Batakrushna Sahoo
Padma Shri 2020
Native of Odisha, an aquaculturist from Khorda, known for his contribution in water conservation and breeding of native fish varieties.

ECO-FRIENDLY INITIATIVES BY THE COLLEGE

THE COLLEGE: AN INTRODUCTION

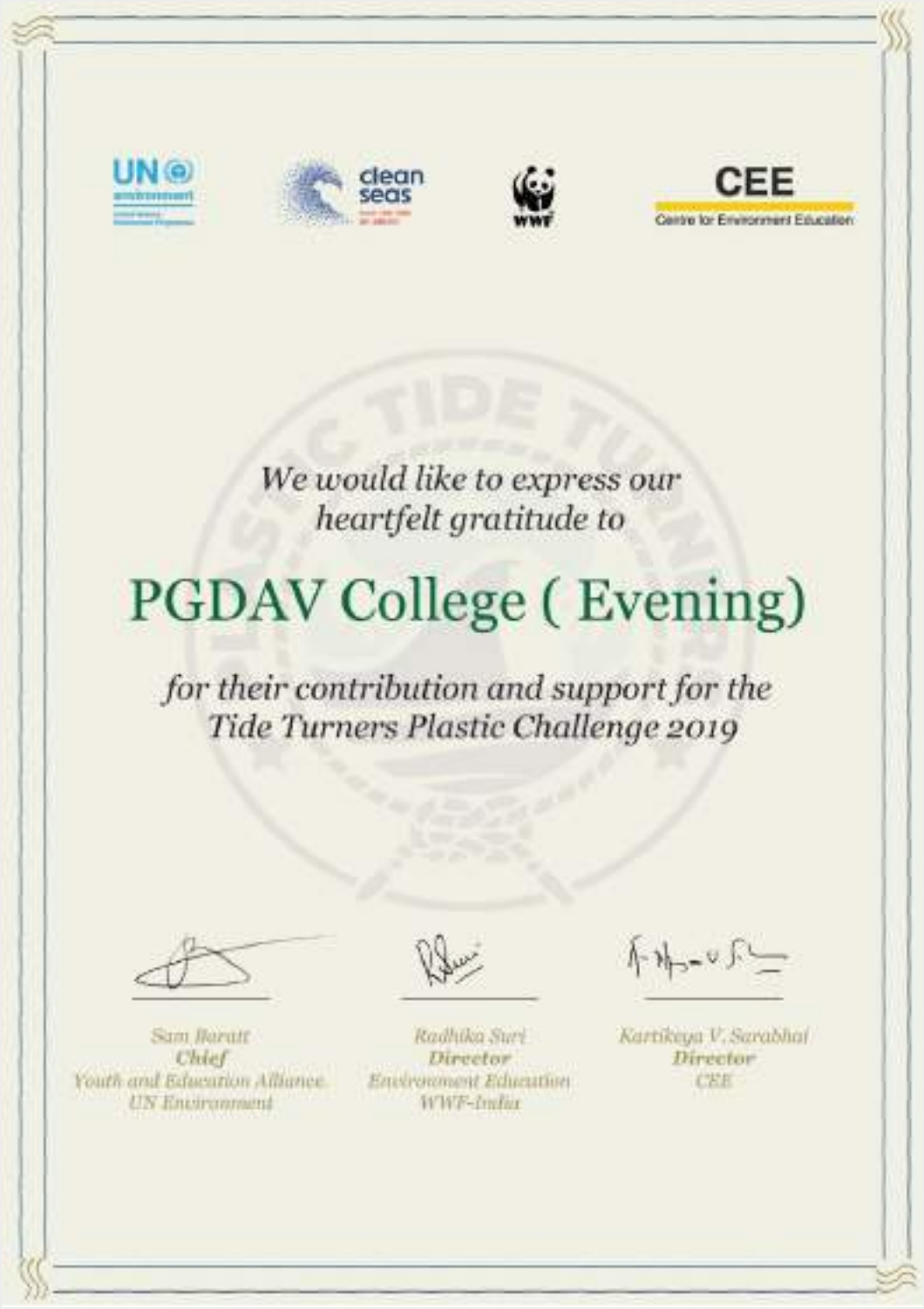
The Pannalal Giridharlal Dayanand Anglo-Vedic College (P.G.D.A.V. College), one of the oldest constituent colleges of the University of Delhi, commenced in a modest way on August 17, 1957. Founder of the leading business house of Delhi of that time, Pannalal Girdharlal (presently having corporates such as Victor Cables Corporation Ltd, Pannalal Girdharlal Ltd, etc.) along with DAV Management & Trust, established the college within small premises on Chitragupta Road, New Delhi with a few teachers and a small group of students.

The evening classes of P.G.D.A.V. College started on July 18, 1958 with the primary objective of imparting education in higher studies to working students. Till 1972, the college functioned in a portion of previously existing school. It was then temporarily shifted to Mandir Marg and remained there for a little over three years. Post that it was shifted to its own building in Nehru Nagar, where it presently stands.

ECO-FRIENDLY INITIATIVES

- ENVIRONMENT AUDIT
- ENVIRONMENT COMMITTEE
- SOLID WASTE MANAGEMENT
  - PAPER WASTE MANAGEMENT
  - FOOD WASTE MANAGEMENT
  - PLASTIC AND POLYMER WASTE MANAGEMENT
  - ELECTRONIC WASTE MANAGEMENT
- ENERGY EFFICIENCY AND ENERGY CONSERVATION
- AMBIENT AIR QUALITY AND NOISE MONITORING STATION
- FLORAL DIVERSITY AND HERBAL GARDEN
- RAIN WATER HARVESTING

ECO SAVIORS



Answers to the Crossword

Across: TEN; DICLOFENAC, NILGAI, EIA, TROPOSPHERE, EUTROPHICATION

Downwards: MONTREAL; STYRENE, METHANE, MANIPUR, BISHNOI, FIFTY, OZONE, INVASIVE, IRULA.

Srishti E-Magazine

Srishti: Quarterly Published Bilingual E-Magazine of Environment Society (SRISHTI)
P.G.D.A.V. College (Evening), University of Delhi
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