

**LECTURES ON  
ENVIRONMENT AND SCIENCE  
ANNUAL REPORT - 2022**



**ORISSA ENVIRONMENTAL SOCIETY  
2022**

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ENVIRONMENT AND SCIENCE  
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**ORISSA ENVIRONMENTAL SOCIETY**

ND-4, VIP Area, IRC Village  
Bhubaneswar-751015, Odisha, India  
Email: oesbbsr@gmail.com,  
Website: [www.odishaenvironment.org](http://www.odishaenvironment.org)

## **Lectures on Environment and Science** (Annual Report - 2022)

Compiled by : **Dr. Sundara Narayana Patro**  
**Dr. Lala Aswini Kumar Singh**  
**Dr. Sudhakar Kar**  
with help and inputs from:  
**Dr. Jaya Krushna Panigrahi**  
**Er. Manoranjan Mishra**

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*The views and contents of the write-ups are entirely those of the concerned authors.*

## FOREWORD



Orissa Environmental Society (OES) was founded in 1982, as a state level voluntary organization, with the objective of promoting mass public awareness for conservation of natural resources and environment. Study, research, documentation, publication, issue-based discussion and consultation, persuasion with appropriate authorities for environment conservation measures, education, awareness, tree plantation etc. are most of the activities of the Society. The Society honours its members, distinguished persons and scholars of the state with awards and felicitations. Dignified members and persons are accorded the honour as Patrons and Fellows.

As on today, the Society has about 800 life members and institutional members who are drawn from different disciplines, and persons interested in conservation of nature and environment. The fact that the Society stands on its own for the last 40 years without any external grants to meet its regular establishment cost, distinguishes itself from other contemporary organizations.

The study and research on environmental pollution in the Angul-Talcher industrial belt, and biodiversity conservation activities in Similipal, Mahendragiri, Chilika, Bhitarkanika, Satkoshia and other natural habitats, mass tree plantation activities in the State, etc. are some of the successful programmes of the Society to name a few. Based on a research study conducted by OES on the problems of fluoride pollution due to industrial activities, a project for fluoride-free water supply to 14 villages in Angul district was implemented in 2000-2001

under Orissa Environment Programme (Indo-Norwegian Cooperation). The Central Pollution Control Board has identified Angul- Talcher industrial belt as an environment hot-spot due to industrial pollution. The Society launched an intensive campaign, to move the Government of India and Government of Odisha that has led to the creation of the eighth biosphere reserve of the country in the Similipal Forest of the Mayurbhanj District (Odisha) in June 1994. For the last several years a sustained campaign is going on towards protection and conservation of the epic fame Mahendragiri hill complex. Mahendragiri is an epitome of rare biodiversity and archaeological monuments. Efforts are made to impress upon appropriate authorities for recognition of this hill forest ecosystem as an Entity of Incomparable Value (EIV) and raise the status to a Biosphere Reserve and also to include in the list of Heritage Sites. Happily, Mahendragiri has been declared as a biological heritage site by the Government of Odisha this year, and is also included in the Ramayana Circuit by the Government of India because of its ancient heritage value. The Society will continue to pursue for biosphere reserve tag to this unique hill forest ecosystem for its richness in biodiversity.

In 1986 while celebrating the 19th World Environment Day the Society organized a national conference on 'Natural Heritages of Odisha' with special emphasis on Chilika lagoon and published its proceedings in 1988 in shape of a book entitled 'Chilika: The Pride of our Wetland Heritage'. This book is the first comprehensive document on all aspects of Chilika. The Society's sustained efforts in highlighting eco-degradation of the Chilika Lake, the largest brackish water lagoon in Asia provided input that helped create the Chilika Development Authority (CDA) by the Government of Odisha to conserve it through eco-restoration activities. The CDA was created in 1992. OES collaborated a Workshop on 'Sustainable Development of

Chilika Lake' organized by CDA in order to draw an implementable action plan for integrated development of Chilika with local community participation as the stakeholders.

The Society also organized a mass mobilization programme for community conservation of blackbucks in Buguda-Ramanda-Bhetnoi area of Ganjam district.

In 2022 the Society successfully completed mass plantation of about 18, 000 saplings in different parts of Odisha state with the financial support of the State Bank of India, under CSR funds. The local officers of the SBI participated in the programme. Schools, other institutions and organisations where the plantations were carried out have shown great enthusiasm and commitment for watering and care of the plants in their premises.

Holding of Monthly Meetings on various current issues related to environment and science is the regular flagship programme of the Society. Guest lectures are being organized by inviting eminent experts in their respective fields. The other most important regular programme of the Society is holding of an annual meet of scientists, environmentalists and nature lovers namely OBPC. The Odisha Bigyan Congress (OBC) had its genesis in the year 1997 to endow with an apt platform to the scientific community of the State for deliberating on the advances in science and technology in diverse frontiers. From 2016 a little amendment has been there in the title of the Congress to make it Odisha Bigyan & Paribesh Congress (OBPC) for focusing attention on the environmental challenges confronting mankind at the present juncture. A large number of students and scholars use the platform provided by OBPC for sharing their research work and achievements. The Congress has been successfully organized in different academic institutions for the

last twenty-three years, thanks to the dedicated teams. In 2022 it was organized in collaboration with the Sambalpur University.

Government of India launched the 'Swachha Bharat Aiviyan', a 5-year programme that ended on 2<sup>nd</sup> Oct, the 150<sup>th</sup> birth anniversary of Mahatma Gandhi. Encouraged by this nationwide campaign the Orissa Environmental Society from 2018 have launched the 'Clean and Green Campaign' programme to promote tree plantation, reduce use of plastic and polythene, conserve water and energy, environmental sanitation and cleanliness, preach and practice circular economy, etc. The campaign covers educational institutions (schools, colleges), public institutions and villages.

The Society publishes annual reports every year containing vital information on all its activities. Matching with the modern technology the Annual Reports are uploaded in our website.

Many OES members have continued to remain very active in print and electronic media for highlighting the issues concerning environment and science. While I congratulate them all, I also feel proud about the strength they provide to the intellectual base of OES. Secretary Dr. Jaya Krushna Panigrahi, Joint Secretary Manaranjan Mishra, Vice President Dr. Lala Aswini Kumar Singh are spearheading the OBPC, Mass Plantation Programme and Annual Report preparation respectively, besides other routine activities, with the assistance of other office bearers and members of the Society, thanks to their sincere efforts, dedication and commitment.

**Sundara Narayan Patro**

President, OES

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# 1. LECTURES ON ENVIRONMENT AND SCIENCE

## PRASANA DAS MEMORIAL LECTURE

(Delivered on 26.10.2022)

### Conservation and Climate Change



#### **Siddhanta Das**

*Former Director General of Forests and Special Secretary in the Ministry of Environment, Forests and Climate Change, Govt. of India*

*The Prasanna Das Memorial Lecture delivered by the Former DG, Forests is very exhaustive and ranges through a wide spectrum of direct and linked subjects to approach 'Conservation and Climate Change'. The editorial board decided to include the entire text as a valuable reference material. - Editors*

#### **Conservation vs. Protection**

M. K. Ranjitsinh in his book "Life with Wildlife" has mentioned that while drafting Wildlife (Protection) Bill 1972 he wanted to use the word Conservation in place of Protection. But since the Constitution of India mentioned about 'Protection' of Forests and Wildlife and there was little time to amend the Constitution they had to settle for 'Protection'. One may ask; What's the big deal? Actually, there is a very significant difference between the two, which many a times are overlooked.

Protection is for maintaining status quo, something like putting things under lock and key and guard it. Whereas, Conservation is all about sustainable management and wise-use of resources. To put it mathematically Protection is maintaining Static Equilibrium and Conservation is maintaining Dynamic Equilibrium. The question is, are we protecting our natural resources or conserving those. Let us take the example of complete ban on felling that was imposed in many States in the past. Was it Conservation or Protection? When I joined as a probationer in the Indian Forest Service, we were taken to Lachhchhiwala Forests near Dehradun in our first field trip and were told that frost is not allowing natural regeneration of Sal in these forests. The forest stock was already over matured and the average age of the standing trees was about 180 years and it was high time for felling of over-ripe trees so that young crop could take their place. But if at this stage the canopy was to be opened up as per prescribed silvicultural norms, Sal seedlings would not get established as those would get killed by frost and the forest would be replaced by 'inferior' species or even blanks might be created. So, a decision had been taken not to carry out any operation and "Protect" the area. As the Director General of Forests, I visited Indira Gandhi National Forest Academy, Dehradun after 36 years and learnt that probationers are still being taken to the same area and are being given the very same logic for 'Protecting' the Forests. But in the meantime, the average age of the trees had become about 220 years! For how long can we continue this? Should we wait till the trees start dying naturally or get vulnerable to insects and pathogens which could lead to the entire forest getting wiped out due to some epidemic? Therefore, we have to evolve sustainable scientific conservation mechanisms in such cases. If nature is not allowing regeneration of Sal seedlings in that area, either

we have to accept that as such or make changes in the environmental conditions that would facilitate regeneration of Sal. We just cannot “protect” the forests just by doing nothing. On similar lines, in the context of Climate Change, we have to develop “conservation” mechanisms for all forms of life on earth.

## **Sustainable Development**

Sustainable Development Goal-15 (SDG-15) is about “Life on land”, one of the 17 Sustainable Development Goals established by the United Nations in 2015. It is supposed to “Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”. The Goal has 12 targets to be achieved by 2030. Progress towards targets would be measured by indicators having primary objectives to:

- a) Conserve and restore terrestrial and freshwater ecosystems,
- b) End deforestation and restore degraded forests,
- c) End desertification and restore degraded land,
- d) Ensure conservation of mountain ecosystems,
- e) Protect biodiversity and natural habitats,
- f) Reduce urbanization,
- g) Protect access to genetic resources and fair sharing of the benefits,
- h) Eliminate poaching and trafficking of protected species,
- i) Prevent invasive alien species on land and in water ecosystems,
- j) Integrate ecosystem and biodiversity in governmental planning,

- k) Increase financial resources to conserve and sustainably use ecosystem and biodiversity,
- l) Finance and incentivize sustainable forest management,
- m) Combat global poaching and trafficking

## **Global warming**

SDG-15 is directly and intricately linked to Climate Changes happening due to Global Warming. Therefore, it is essential to understand Global Warming to appreciate the SDG-15 and its targets.

The earth is surrounded by an atmosphere which has several Green House Gases (GHG) such as water vapour, carbon dioxide, methane, nitrous oxide. These gases trap a part of the solar energy falling on surface of earth during the day and release those gradually. This keeps the earth warm and cozy. Without GHG, the temperature could go beyond 50°C during the day and fall below minus 30°C in the night and the average temperature of earth would be about minus 18°C rather than the present average of 15°C.

Industrial revolution started in mid-18th Century and we started burning fossil fuels, particularly coal. This gradually increased carbon dioxide concentration in atmosphere; from about 270 parts per million (ppm) to 420 ppm. In the initial years the impact was negligible as industrial revolution was confined to a few developed countries. Just 70 years back atmospheric carbon dioxide concentration was less than 320 ppm. In the past few decades most of the counties have joined the bandwagon of unsustainable development and the atmospheric carbondioxide concentration has jumped from 400 ppm to 420 ppm in last six years and the jump is a staggering

410 ppm to 420 ppm in the past couple of years. Increase in GHG in atmosphere is accelerating the rate at which energy is being trapped by the earth which is resulting in global warming. We only started feeling the adverse impact during the 2nd half of last Century. It may be seen, most of the environmental laws world over have been formulated in past 50 years. Consumption, particularly of comfort, luxury and non-essential items has a direct correlation with temperature rise. The process of 'development' and quest for 'comfortable' lifestyle have been alarmingly accelerating the emission of greenhouse gases. In the last Century the average temperature of earth increased by 0.5°C and in first 15 years of this Century it has further increased by 0.61°C. It is anticipated that it will rise by 2°C by 2050 and by 4 to 6°C by 2100.

The problem is that with our present technical and scientific knowhow we cannot handle a situation that might arise due to a temperature rise of 2°C and beyond. Therefore, the world community is quite concerned and is grappling with mechanisms those could arrest the rate of temperature rise. The target is to restrict temperature rise to 1.5°C. But we have already crossed 1.1°C and are just left with a buffer of hardly 0.4°C. It is now anticipated that we will breach the 1.5°C limit before the year 2030. We have a stupendous task in hand. We have to take a slew of adaptive and mitigative measures and seriously implement those. This would really call for very hard decisions.

## **India's Climate Action Plan**

United Nations Framework Convention on Climate Change (UNFCCC) has been working on making concerted efforts for reducing emissions with a view to arrest temperature

rise to 1.5°C. But this got a huge setback as the largest emitter USA withdrew from the global effort for some time, when Donald Trump was the President. At this stage, India came forward to provide leadership. In the Paris UNFCCC in 2015, India announced to sequester 2.5 to 3.0 billion tons of carbon dioxide equivalent in its forests, besides taking a number of mitigative and adaptive measures. In the meanwhile, all the States had prepared Climate Change Action Plans to dovetail into national commitments. But unfortunately, commensurate budget provisions are not forthcoming. Moreover, the country also has a very strong development agenda to pursue.

India had put in place its National Action Plan on Climate Change (NAPCC) in June 2008 spelling out its strategy. The National Action Plan emphasizes on a strategy for country's development programmes commensurate with adaptation to Climate Change measures and ecological sustainability. The National Action Plan recognizes that climate change is a global issue and, that it should be handled through a globally collaborative and cooperative effort based on principle of equity. India is committed to and even providing leadership in this as a responsible member of the international community. However, it emphasizes that, this requires not only sustainable production processes, but also sustainable life styles across the globe. India has been advocating to adopt per capita GHG emissions to form the basis for equitable distribution of responsibility for tackling climate change related issues. The Action Plan assures the international community that India's per capita GHG emissions would not exceed the per capita GHG emissions of developed countries, despite India's developmental imperatives. The per capita GHG emissions of the developed countries is in the range of 15 tons per year, whereas, India's corresponding figures were

only around one ton per annum by the turn of the Century. But the cause of concern is that now the figures have almost doubled, pushing two tons per annum. Although it is way below the per capita emission by developed countries, in absolute terms its contribution to global emission is becoming very high. The experts are particularly worried about the fast development in the BRICS countries, Brazil, Russia, India, China and South Africa.

India has made it clear that, it would not like to compromise on its development goals for increasing living standards of its citizens but at the same time stands committed to reducing their vulnerability to impacts of climate change. With this in view, it has launched eight National Missions which form the core of the National Action Plan:

- a) **Solar Mission** for promoting development and use of solar energy for power generation and other uses, and wean away fossil-based energy options in urban areas, industry, and commercial establishments. Its goal is to generate at least 10,000 megawatts of solar power and to create a solar research center among other things.
- b) **Mission for Enhanced Energy Efficiency** aims to strengthen market for energy efficiency by creating conducive regulatory and policy regime and foster innovative and sustainable business models to energy efficiency sector and setting up financing platforms for public-private partnerships to reduce energy consumption.
- c) **Mission on Sustainable Habitat** seeks to promote energy efficiency in urban planning through measures such as putting more emphasis on urban waste management and recycling, strengthening enforcement of automotive fuel

economy standards, using pricing measures to encourage purchase of fuel-efficient vehicles, and providing incentives for people to make greater use of public transportation.

- d) **Water Mission** aims to increase water use efficiency through pricing and regulatory measures, including the recycling of waste water, increase in irrigation efficiency, and incentives to promote water-neutral or water-positive technologies and ground water recharge.
- e) **Mission for Sustaining the Himalayan Ecosystem** seeks to promote conservation of biodiversity, forest cover, and other ecological values in the Himalayan region to help stop the retreat of glaciers, as they constitute a major source of India's water supply.
- f) **Mission for a "Green India"** targets to expand forest cover in the country through afforestation.
- g) **Mission for Sustainable Agriculture** envisages adaptation in agricultural sector by supporting development of climate-resilient crops and expansion of weather insurance mechanisms, among other measures.
- h) **Mission on Strategic Knowledge for Climate Change** promotes "a better understanding of climate science, impacts and challenges." It calls for establishment of a new Climate Science Research Fund, improved climate modelling, and increased international collaboration. It encourages private sector initiatives aimed at developing adaptation and mitigation technologies through venture capital funds.

The National Action Plan also envisages other initiatives aimed at enhancing mitigation and adaptation. These include research and development in the area of ultra-super critical

boilers in coal-based thermal plants; integrated gasification combined cycle technology to make coal based power generation efficient; setting up more combined cycle natural gas plants; promotion of nuclear energy through adoption of fast breeder and thorium-based thermal reactor technology in nuclear power generation; adoption of high-voltage AC and high-voltage DC transmission to reduce technical losses during transmission and distribution; small and large scale hydro power; promotion of renewable energy technologies such as bio-mass combustion and gasification-based power generation; enhancements in the regulatory/tariff regimes to help mainstream renewable-based sources in the national power system; and renewable energy technologies for transportation and industrial fuels. In addition, the Action Plan envisages effective disaster management strategies that include mainstreaming disaster risk reduction into infrastructure project design, strengthening communication networks and disaster management facilities at all levels; protection of coastal areas, provision of enhanced public health care services, and assessment of increased burden of disease due to climate change. The Action Plan also highlights the role of Central Government, State Governments and local Bodies in putting in place appropriate delivery mechanisms and building adequate capacity and knowledge in relevant institutions for effective adaptation and mitigation actions.

### **India Emerges as the leader after the Paris UNFCCC in 2015**

As a follow-up of the India's commitment in the Paris UNFCCC, it has taken several measures to achieve the target of sequestering 2.5 to 3.0 billion tons of carbon dioxide equivalent in forestry sector. Roughly the Carbon dioxide equivalent stored in forests of our country store is about 25.7 billion tons. India is not only, amongst the top ten forested countries, but also

amongst the top ten countries in the world where forest cover is increasing and its forests are sink of carbon dioxide. This is no mean achievement as (a) India supports 17 percent of world's population over 2.4 percent of global land mass, (b) economy of rural population of the country is dependent on forests to a great extent, and (c) it is also home to about 18 percent of world's cattle population most of which is dependent on natural forests for fodder.

In spite of such huge anthropogenic pressure, India's forests on an average absorb 128.3 million tons of carbon dioxide equivalent. Therefore, it is expected that by 2030 the increment would be 1.92 billion tons of carbon dioxide equivalent. That means there would still be a gap of 0.6 to 1.1 billion tons to achieve its international commitments.

To bridge this gap two policy level interventions have been chalked out. First, to increase the quality of the existing forests and second, enhance tree cover outside conventional forests. Forest Survey of India (FSI), maps the forest cover of the country every two years through interpretation of satellite imageries. It classifies the forests as Very Dense Forest (VDF) having canopy density of more than 70 percent, Moderately Dense Forests (MDF) having canopy density between 40 to 70 percent and Open Forest (OF) having canopy density between 10 to 40 percent. Areas having less than ten percent canopy density are termed as scrubs and not considered as forest. As per the latest report of the FSI published in 2021, 99,779 square km, which is about 3.04 percent of land area of the country is classified as VDF, 3,06,890 square km, about 9.33 percent as MDF and 3,07,120 square km, about 9.34 as OF. Tree outside Forests (TOF) accounts for 2,92,907 square km, about 8.91 percent. Carbon stored in and sequestered by a forest has direct correlation with its density. Actually, most part of the carbon

is stored in the soil in dense forests. Therefore, for qualitative improvement of forests, the objective has been set to upgrade the existing forests from OF to MDF and to VDF. This way, the area remaining same potential for carbon sequestration could be accelerated.

## **Landscape based Catchment Area Treatment**

Most of the natural forests form catchment of river systems. Therefore, qualitative improvement in forest cover could be brought about by enriching the Catchments. Catchments are origin of all the rivers. Therefore, sustainable solution for making the rivers clean and perennial lies in treatment of the catchments. All the micro-catchments of all the streams those contribute to a major river system put together is the Catchment of the River System. Usually, precipitation received by the catchments take the path of least resistance and rush to the rivers carrying the top-soil from the catchment, in the process making rivers muddy. The forest floor also becomes dry within few months after the rains are over.

Management and conservation of fresh water is a critical issue. In India, we have about 4% of fresh water of the world that caters to 17% of the world's population. Generally, when we talk of water management we focus only on flow, storage and distribution, but tend to ignore the source, which is more important than the rest. Watersheds are origin of all the rivers and most of the catchments are in Forests. Had there been no forests, water received during rains would simply be rushing to the sea through streams and rivers during the rainy season itself. It may be noted that forests are much beyond trees, it is an ecosystem comprising of soil, micro-organisms, shrubs, herbs, and trees. The main role of the forests is to distribute the

precipitation received in Catchments into three parts. (A) The part that percolates to recharge the ground water tables, (B) the part that flows below the surface to emerge as natural springs and (C) the part that flows over the surface as streams as tributaries of the river systems. Forests also plays a critical role in slowing down the flow of surface runoff so that it is released through the streams over a longer period of time. But due to over exploitation and degradation the equation for volume of water that flows in the river systems, has changed from  $A+B+C$  to  $(A-A1) +(B-B1) +(C+A1+B1)$ . Essentially, the surface runoff has increased considerably at the expense of the other two components. Moreover, due to soil compaction the last part is rushing to the rivers over a shorter period of time causing floods. The river beds are also getting silted up due to erosion in the catchments and thus increasing flood probability in subsequent years. Flooding of rivers is a criminal wastage of scarce fresh water. Consequentially, it is also resulting in much less or no flow during off seasons.

But the rate of discharge of pollutants and sewage to the river systems is also on the rise, which is leading to severe water pollution. Instead of ensuring minimum ecological flow in rivers, we are focusing on Sewage Treatment. As such any amount of treatment of sewage will not make the discharge devoid of pollutants. Moreover, most of the Sewage Treatment Plants (STPs) either are defunct or operate par below design. STPs try to treat symptoms rather than the causes of the ailments. In case of river Yamuna there is virtually no flow during major part of the year, it mostly carries untreated or at best partially treated sewage draining into it. Sustainable solution for making the rivers clean and perennial lies in treatment of the catchments.

It is possible to slow down the streams coming out of the catchments through mechanical and biological interventions.

This way it can be ensured that water keeps trickling to the rivers till next monsoon. This would also result in finding permanent solution to many of the environmental concerns.

First, in the process, energy of streams will get dissipated inside the catchment, which in turn would substantially reduce the vulnerability of soil getting eroded.

Second, retention of moisture in the catchment for a longer duration would significantly augment natural regeneration of forests.

Third, a longer moisture regime would go a long way in preventing forest-fire, a major mechanism of releasing carbon dioxide to the atmosphere.

Fourth, availability of water and fodder inside the forests would restrain the wild animals in their natural habitats and thus minimizing human-animal conflict.

Fifth and the most important, this would result in recharging of ground water and make the farmers happy.

The ultimate mission would be to make all the rivers clean and perennial.

Forest Research Institute (FRI) Dehradun has already prepared an excellent project for Catchment Treatment, for river Ganga, which is under implementation in five States. Based on its success Indian Council of Forest Research and Education (ICFRE) has prepared similar plans for 13 major river systems of the country through its institutes, which has been approved by the Ministry of Environment, Forests, and Climate Change (MoEFCC). These plans are likely to be implemented over a decade or so.

### **Management of Micro-watersheds for immediate and localized solution**

Through micro-watershed management, localized

solutions can be found out for abatement of water-stress in the drought prone districts and subsequently providing water security to the country in the long run.

Currently, several districts in the country are facing crisis due to drought. The prevailing severe water stress is primarily due to:

- (a) ground water levels declining too far and
- (b) drying up of the streams and rivers in summer

The process of recharging the ground water tables have been getting severely impeded due to inadequate percolation of rain water. Similarly, the streams and rivers are getting dried up during summer as the rainwater received in the catchments are rushing above the surface flushing the entire volume of water over a shorter period.

Each habitation or village receives water supply, both over-ground or underground attributable to some micro watershed. The moisture received in the micro-watershed can be retained in the localized catchment over a longer period through biological and mechanical means.

Most of the precipitation received in the micro-watersheds in the normal process should percolate either to recharge the ground water table or surface as springs downstream. But due to land degradation soil compaction takes place and porosity of soil is reduced. As a result of this water does not percolate to the extent it should normally have and larger portion flows above the surface.

Similarly, most of the area in the micro-catchments has been under forest cover, which has degraded over time primarily due to anthropogenic reasons. A natural forest comprises of all types of vegetation (from ground flora to trees), micro-organisms

and humus. One of the major roles of the forest eco-system is also to retard the flow of surface water and recharge ground water table.

Watershed Management is a process of restoring land degradation those have taken place over a long period of time. Land degradation can be addressed primarily through mechanical interventions such as:

- (i) **Check dams:** (Series of micro dams across the streams starting from their sources of origin at regular intervals, till those reach plains, to slow down the flow)
- (ii) **Under-soil reservoirs:** (once the streams reach the plains under-soil diaphragms can be placed across those till those hit underground hard surface to let water percolate downwards and get stored in underground reservoirs. Dry soil has about 40% free space in it, which can be occupied by the percolated water. The stored water would gradually be released as springs downstream)
- (iii) **Contour bunding:** (creation of bunds along the contours to retard the flow of the streams.

**Forest Degradation** can be addressed by both vegetative and mechanical means:

- (i) Assisted Natural Regeneration: (Augmenting existing tree vegetation by planting naturally occurring species)
- (ii) Planting soil binding indigenous plants
- (iii) Mulching: (spreading materials over the surface of the soil as a covering. It is used to retain moisture in the soil, suppress weeds, and keep the soil cool. Organic mulches also help improve the soil's fertility, as they decompose.)
- (iv) Half-moon trench: (to retain moisture near the planted saplings)

In recent years the State of Rajasthan has been able to tackle water crisis in the villages through treatment of micro-watersheds in the past 5 years. In many of the villages taken up under “Mukhyamantri Jal Swablamban Yojana” there has been significant rise in water tables and the several dried-up wells have revived.

### **Augmenting Water Security through Spring Rejuvenation in Himalayas**

Brij Mohan Singh Rathore, the then Chief Policy Adviser in International Centre for Integrated Mountain Development (ICIMOD) in Kathmandu had briefed the NITI Aayog in 2021 in a brain storming meeting, largely focusing on the Himalayan Springs. He highlighted significance of springs as groundwater sources in the mountains being the lifeline of millions of people across the Himalayas. He categorically stated that these are increasingly drying up, or becoming seasonal, causing untold misery to both rural and urban inhabitants. According to one estimate, of some 4 million springs in the Himalayas, at least 1/3rd of these are drying up and more than half have witnessed decline in water discharge. The water problems of Shimla and other hill towns in India are a direct result of drying of springs. I would like to quote the following from his presentation:

- Depletion of springs due to anthropogenic and climatic factors is a critical issue in all the Hindu-Kush-Himalayan (HKH) countries including India, Bangladesh, Bhutan and Nepal and requires urgent action as mentioned in the HKH Call to Action.
- As we gather experience, we can put together the building blocks. The Programs of spring mapping and rejuvenation

involves science, traditional knowledge and spring water governance issues. It calls for well-coordinated response across multiple actors and sectors within country and regionally as well.

- The traditional watershed approach does not include aquifers (groundwater) and hence there is a need for a new paradigm that combines watersheds and aquifers to form a spring-shed.
- A larger push on Spring-shed management as National Mission or Program would be one of the most attractive nature-based solutions with several benefits for people up- and downstream (particularly women and marginalized), biodiversity and environment.
- ICIMOD as regional intergovernmental organization could help in exchange of knowledge and experiences on GESI responsive best practices, governance set-up, research and innovation, co-developing open access regional database for decision support, capacity building and resource mobilization. This is a very good area to bolster regional cooperation. Hon'ble Member NITI Aayog, Dr. Saraswat while speaking during International Conference on Resilience HKH in Dec 2017 had suggested that we should launch HKH wide Spring Mapping and Revival Program. This will help bolster regional cooperation for resilient HKH,

## **Transforming Shifting Cultivation in North East India**

While different programmes to address shifting cultivation claim drastic reduction both in the practice and in the area under shifting cultivation, large scale forest cover loss in northeast India is still attributed to shifting cultivation (FSI

report 2017). There is lack of updated and authentic data on the area under shifting cultivation as well as the current total number of households practicing shifting cultivation. About 8,500 sq. km of area in northeast India is shown under shifting cultivation (Ministry of Statistics and Programme Implementation (MoSPI), Year Book 2014), but there is data inconsistency among agencies.

-Shifting cultivation is also a regional phenomenon across NE India, Bangladesh and, Myanmar. Expansion of cash crop plantations as alternative options to shifting cultivation have resulted in a drastically reduced forest cover and shifting cultivation is blamed for the deforestation.

- Key elements in transforming shifting cultivation will include: updating the information on shifting cultivation (area under cultivation/fallow and households involved); encouraging states and central ministries to recognize home gardens as a distinct agricultural land use category with dedicated schemes for promotion of home gardens, village level perspective land use planning and zonation to improve land use, integration of niche crops and other products that provide income and enterprise development opportunities for shifting cultivators.
- Amendment of credit guidelines to allow group guarantee (from village/clan authorities) for loans instead of land title deeds in the shifting cultivation areas and categorization of shifting cultivation lands as distinct land use
- ICIMOD has recently published policy briefs on transition of shifting cultivation and its impact on ecosystem services, and quantifying the extent of shifting cultivation. Both of these policy briefs are extremely pertinent in this context.

## **Disasters Risk Reduction (DRR)**

Over the last two decades, India's mountain states and downstream areas have experienced unprecedented flood disasters such as the 2013 Uttarakhand disaster, the 2014 floods in Kashmir, and the 2010 flash floods in Leh, Ladakh. Koshi flash floods are recurrent phenomenon in Bihar and Brahmaputra has caused massive damage to Assam recently. The very recent water induced disaster at Rishi Ganga in Rudra Prayag district has caused massive damage to life, property and infrastructure.

Most of the Himalayan Rivers are trans-boundary, originating beyond the national boundaries. It therefore requires functional instruments of trans-boundary cooperation to share data and information. The initiatives like Upper Indus Basin Network (UIBN) and Koshi Disaster Risk Reduction Knowledge Hub (KDKH) facilitated by ICIMOD are worth looking at.

These regional networks strive to bring best of science, policy and practice constituencies together as knowledge-sharing platforms. It has developed applications and mechanisms such as drought monitoring, early flood warning systems, and flood outlooks aimed at enhancing water, food, and energy security in the basin. But these trans-boundary networks need larger engagement and support from the policy makers.

## **Atmospheric Pollution**

The Himalayas receive significant amounts of air pollution from within and outside of the region. In many places, both urban and rural, pollutants have reached alarming levels, threatening the health of millions of people in the region, particularly women, children, and the elderly; in each of these

groups, the poor are the most vulnerable. The largest sources of air pollution in the Himalayan region are solid waste, household emissions from cook stoves, and open burning of agricultural residue. Forest fires, diesel engines, brick kilns, and fossil fuel-based energy production also comprise a significant portion of air pollution. It calls for air shed approach which may cut across state and national boundaries rather than city specific approaches to tackle atmospheric pollution

Brick Kiln initiative of ICIMOD has made wider application of zigzag technology by conversion of fixed chimney bulls trench kilns to more efficient and less polluting zigzag kilns in Nepal and other HKH countries including India. By mainstreaming zigzag brick production practices across Nepal, ICIMOD has facilitated lowering of emissions of black carbon by 60% and integrated socio-economic aspects of production, thereby helped transforming the brick sector into a healthier, socially responsible, more profitable industry. The initiative has strategized mainstreaming/integrating training for brick workers on cleaner brick production under India's Skill Development Programme. Institutional collaboration of ICIMOD with Central Pollution Control Board India, will further strengthen work on Atmospheric Pollution as a regional phenomenon.

**The Himalayan University Consortium (HUC)** facilitated by ICIMOD and driven by the country chapters is a network of 90 member universities and higher education institutions in eight Hindu Kush Himalayan countries to foster regional and global cooperation in research and education of and for fair, inclusive, and sustainable development in the HKH Mountains and adjunct areas.

In India, HUC is now engaged with over 18 Himalayan universities and institutions. HUC Thematic Working Groups on Water, Climate Change, Cryosphere and Society, DRR and Resilience, Mountain Heritage and Tourism, Mountain Agriculture and Biodiversity in India are collaborating to conduct inter- and trans-disciplinary field research, develop knowledge products including policy briefs to bridge science-policy-practice, and develop e-compendia of existing research/evidence, expertise, and best practices. Two cross-cutting Work Groups on Education and Indigenous Local Knowledge (ILK) and Locally-led Adaptation have started conducting regional research on graduate competency and curriculum for sustainability and develop inventory of ILKs for Indian Himalayan Region (IHR). A Youth Leadership group seeks to engage with various cross-cutting Working Groups. All of these groups and clusters have active fellows and institutional members from India, and the majority of those groups are led by India-based Co-Leads. The ownership of HUC among HUC members has been increased significantly during the past two years. HUC Country Chapter in India will look forward to collaborate with the Group of Central Universities in IHR, under the auspices of NITI Aayog, in setting and achieving common goals.

## **Wildlife Conservation and Water Security**

Forest density and eco-system conservation have a strong correlation. A system in wild has several entities, which are intricately linked to one another. In most of the ecosystems of India's mainland Tiger is the apex species in food chain. About 500 deer (or equivalent mass of herbivores) are required for sustenance of one tiger. In this food chain leopards, hyenas,

etc. act as co-predators and vultures, jackals, etc. as scavengers. Certain quantity of fodder and grass is required for sustaining the herbivores. The vegetative biomass is dependent on the moisture regime. This conversely means, the moisture regime controls the volume of fodder and grass, this in turn limits the number of herbivores in the system, which in turn limits number of predators and scavengers. Therefore, increase in or stability of tiger number is an indicator of the health of moisture regime which provides us water security, the most important element in today's context. Therefore, when India achieved the international commitment of doubling of the tiger population before time, the Hon'ble Prime Minister announced it to the world with fanfare. Disturbance to any of the elements in food chain can easily destroy the ecosystem. Now a days we are observing that tigers are getting into human habitations. This means the inadequate moisture regime in the system is pushing the territorial animals to areas outside their usual habitat. It also means that we are encroaching in to their habitat. By doing so we are becoming the main cause of compromising the moisture regime, the elixir for our very survival.

"Project Tiger" was launched in April, 1973 with the objective of maintaining a viable population of Tigers in the country. It started with nine reserves, encompassing an area of around 13000 sq. kms and covered 28 tiger reserves over 37,761 square km in 17 States in 2008 when NTCA was constituted. At present, there are 50 tiger reserves spread over 18 states with 40145.30 sq. kms. area under core/ Critical Tiger Habitat and 32603.72 sq. kms. area under buffer, altogether 2.21% of India's geographical area. Tiger being the apex species in food chain the focus is on holistic management of ecosystem. Consequent to vanishing of Tigers from Sariska the Government of India constituted the Tiger Task Force in 2005 for more intensive

management. Tiger population in 2005 which had dwindled to 1411 is now on the path of recovery and has reached 2226 as per latest census.

Similarly, Snow leopard is the apex species in Himalayan Mountain ecosystem. So are the lions, crocodiles, large snakes, falcons are apex species in their respective food chains. Therefore, we may safely conclude that water security of the country is directly linked to conservation of Wildlife and Environment.

### **Elephants, the Architects of Landscapes**

Some people argue that elephant is too large an animal and should become extinct like the dinosaurs in the process of evolution. They perhaps do not appreciate the role played by these magnificent animals.

Elephants are long ranging animals and travel about 50 km a day. They keep on eating (about 100 kg a day) and defecating for most of the time. Food in their stomach does not get fully digested. Since the elephants keep eating, travelling and defecating, they actually chemically process tough fibrous materials and spread across the landscape. Thus, they play a crucial role in the architecture of the landscapes.

Unfortunately, linear infrastructures like, roads, railway lines, transmission lines, canals, etc. are fragmenting the landscapes and restricting movement of elephants. Wildlife Institute of India has brought out a set of guidelines on how to provide passages across the linear infrastructures. National Board of Wildlife has made it mandatory to adopt these guidelines.

Elephant population in our country is stable. In many

parts of the country, it has gone beyond the carrying capacity of the habitats and is resulting in severe human-elephant conflicts. In such areas it is necessary to control their population. Immuno-contraception could be adopted there. But the Human-Elephant conflict continues to be a very serious issue at hand.

### **Vultures: Nature's Scavengers**

Populations of three resident vulture species of India have decreased by more than 90% since mid-1990s, and they continue to decline. Mortality of vultures is mainly attributable to renal failure caused by diclofenac, an anti-inflammatory drug. Despite ban on veterinary usage of diclofenac in 2006 between 2011 and 2014, 65 to 70% vultures have died due to this. The Vultures in India are on the brink of extinction. According to our census, we had estimated 40 million vultures in the 1990s, which declined by 99.9% in 2007. By 2015, the vulture population showed some sign of improvement but still very critical and their population is still very small, just a few thousand. There are nine species of vulture found in India. Out of these, four are critically endangered and require urgent attention. The population numbers for these four are still dropping at an alarming rate.

Vultures play a critical role in keeping the countryside clean. Along with lesser scavengers such as jackals, hyenas, dogs, crows and kites, vultures play a key role in disposing of the carcasses of wild and domestic dead animals. Their sheer numbers ensured that no decaying carcasses remained long enough to spread diseases and contaminate the soil and water. In the absence of vultures, the dead body of cattle acts as media for the bacteria and the fungus to grow and multiply in millions and go into the soil, water and cause diseases. The vanishing

vultures also led to an increase in the numbers of other animals of prey animals like rats and dogs. We have observed the growth of an entire generation of stray dogs that feeds only on carcasses and this increases the risk of spread of Rabies, and Anthrax.

Still, we are hopeful of bringing back the vultures from the brink of extinction through several interventions.

### **Enabling legislations and targeted conservation**

Focusing on identified issues has resulted in significant achievements. Focus on Wildlife Management has resulted in maintaining sustainable and stable population in wild of several flagship species like Tiger, Crocodile, Lion, Rhinoceros which at some points of time were in the brink of extinction.

During last 50 years lion population increased from 177 in 1968 to a sustainable and vibrant population of 523 in 2015. The status of Asiatic lion has been upgraded from “Critically Endangered” to “Endangered” by IUCN in 2010. Previously lions were found only in an area of around 1900 square km in two districts, Junagadh and Amreli, now lions are dispersed and spread over an “Asiatic Lion landscape” of around 20,000 square km in Saurashtra region of Gujarat.

In 1966 in Kaziranga total population of Rhinoceros was 366, which has gone up to 2401 as per 2015 census.

All the 3 varieties of Crocodiles in India; salt water crocodile, fresh water crocodile and gharial were in the verge of extinction in early seventies. When the Crocodile recovery programme was launched in 1973 Bhitarkanika area in Odisha had an estimated salt water crocodile population of about 90. Through sustained effort and management interventions the population has now stabilized around 1700.

## **Recovery of Endangered Species**

Ministry of Environment Forest and Climate Change has identified some critically endangered species like Snow Leopard, Bustard, Dolphin, Hangul, Nilgiri Tahr, Marine Turtles, Dugongs, Edible Nest Swiftlet, Asian Wild Buffalo, Nicobar Megapode, Manipur Brow-antlered Deer, Vultures, Malabar Civet, Swamp Deer and Jerdon's Courser for taking up recovery programmes. Now we are focusing on four species with funding out of Compensatory Afforestation Fund (CAMPA). These are; Great Indian Bustard, Gangetic River Dolphins, Dugongs and Manipur's brow antlered deer or Sangai

### **Great Indian Bustard (GIB)**

Earlier GIB was distributed throughout Western India, spanning eleven states, from Thar Desert in the north-west to Deccan plateau of the peninsula. The population was about 20 to 40 thousand in the 1950s and was about a thousand two decades ago and now we hardly have 125, confined mostly to Rajasthan and Gujarat. Bustards generally favour flat open landscapes with minimal visual obstruction and disturbance, therefore adapt well in grasslands. The species is in the verge of extinction mainly due to degradation of grasslands. Our objective is to enhance population to about 1000 through habitat improvement and in-house hatching of eggs

### **Gangetic River Dolphin**

The Ganges River dolphin is a reliable indicator of the health of the entire river ecosystem. We have declared it as the National Aquatic Animal in 2009. The Gangetic or River Dolphin is one of the most endangered species found in the Ganges,

Brahmaputra and their tributaries. The species is present in Nepal, India and Bangladesh. Dolphins are one of the oldest creatures in the world along with some species of turtles, crocodiles and sharks. No reliable population estimates is available for India. The global populations may be between 2000-3000. The Ganges River dolphins cannot see and hunt by emitting ultrasonic sounds, which bounces off fish and other prey.

### **Dugong (sea cow)**

Although Dugongs have lifespan of 70 years or more but very low rate of reproduction makes these vulnerable to extinction due to poaching. Dugong is the only herbivorous mammal that is strictly marine. Dugongs are restricted to coastal shallow marine habitats and graze on the sea grass meadows in coastal waters and are therefore called as “Sea Cows”. It is estimated that there are just 200 dugongs in Indian waters in the Gulf of Mannar, Andamans and in the Gulf of Kutch. Their habitat is under threat due to mining, trawling etc.

### **Manipur’s brow antler deer (dancing deer)**

Sangai was believed to be almost extinct by 1950, but six individuals were spotted in 1953 and the State of Manipur protected the species to increase the population to 204. Sangai’s habitat is a floating biomass locally called “phumdi” in Loktak Lake of KeibulLamjao National Park. Its habitat is under threat due to continuous inundation and flooding caused due to artificial reservoir (Loktak hydro-electric project). Water quality of the reservoir is degrading due to pollution and stoppage of nutrient supply. There is also invasion of non-native plants like

Paragrass. There has been decrease in area of phumdi from 31.60 square km in 1993 to 23.72 square km in 2010, which is directly impacting the population of Sangai deer. However, as a single, isolated, small population, these deer are especially at risk. One random catastrophic event: flood, fire, disease, could destroy the entire population or reduce the gene pool so much that natural recovery would not be possible. Therefore a “second home for Sangai” is an integral part of the conservation strategy for the species.

### **Promotion of agroforestry and restoration of degraded forest landscapes**

Wood is one of the important produces coming from forests that are renewable natural resource. Mankind has used wood due to its versatility since time immemorial for housing construction, furniture, agricultural implements, transport vehicle, and above all a fuel for various household needs. But what is of critical importance is that Wood is a carbon neutral resource. Metals and plastic are generally used as substitute of wood. Metals are generally extracted from ores and the process involves emission of good quantity of carbon dioxide. The process of moulding and manufacturing also have large carbon foot prints. Same is the case with plastic, it also has huge carbon footprint. On the other hand, trees and forests absorb carbon dioxide from atmosphere through the process of photosynthesis, convert carbon into wood biomass and releases oxygen to atmosphere. As long as the trees are growing and the forests are healthy the process continues. When the tree starts decaying or the forests degrading the reverse process sets in, that is they become carbon sources instead of being sinks. Therefore, it is important to “grow more wood and use more wood”. However,

in the natural forests major portion of carbon is stored on the ground and below the surface, therefore, it is important to focus on qualitative improvement of natural forests. On the other hand, it is important to grow tree outside forests through plantations, agro-forestry and farm-forestry with the objective of producing carbon neutral renewable resource.

In the context of ongoing global dialogues on Climate Change, use of wood products is emerging as a greener alternative to its competitors that have higher embedded energy and other adverse environmental implications. Trees sequester atmospheric carbon in the growth process and the carbon continue to remain locked in wood products. It is therefore necessary to increase the use of wood and wood products in all possible ways, in the construction and packaging industries, home/office furnishing and interiors.

India is committed to large-scale reforestation and tree-based landscape restoration. The country has committed to bring a minimum of one-third of its total geographical area under forest and tree cover under its National Forest Policy. Further, India has a Land Degradation Neutrality commitment to restore 26 mha of degraded land by 2030 (under the United Nations Convention to Combat Desertification). As part of the Paris Agreement signed in 2016, India has decided its Nationally Determined Contribution to create an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through additional forest and tree cover, by 2030.

**National Forest Policy, 1988** brought in policy shift towards conservation and management of forests for eco system services. This policy shift caused enhanced focus on “restoration of degraded forests” and ‘Trees Outside Forests’ (ToF), particularly agroforestry, to reduce pressure on forests and to

meet the needs of the people in respect of wood and wood products.

According to India State of Forest Report (ISFR) brought out by FSI about 30% of areas recognized as forest do not support forest growth, and around 43% of forested areas have crown density less than 40%. This brings out the fact that sizable forest areas are under various stages of degradation, and they need restoration initiatives to harness potential eco-system services in addition to meeting the livelihood needs of forest dependent communities living in the vicinity of forests. Restoration of such areas can be taken up under the Green India Mission, one of the eight missions under the National Action Plan on Climate Change, that targets to further increase the forest/tree cover to the extent of 5 mha and improve quality of forest/ another 5 mha of forest/non-forest lands along with providing livelihood support, and from funds available under CAMPA, and also Externally Aided Projects.

FSI has published Technical Information Series Vol. 2. No. 1 titled "Tree Outside Forest Resources in India" wherein the extent of ToF in the country is reported to be 29.38 mha (8.94% of TGA) comprising of tree cover 9.5 mha and Forest cover outside RFA 19.88 mha with Growing stock of 1642.29 million cum and potential annual yield of 85.16 million cum. The report also has estimated the number of trees and volume of top 20 species in Rural and Urban areas. The most important species in rural areas that are important for wood production include *Mangifera indica*, *Acacia arabica*, *Eucalyptus*, *Tectona grandis*, *Hevea brasilensis*, *Grewia oppositifolia*, *Dalbergia sisso*, *Populus* spp. Bulk of the growing stock is in scattered form (61.5%), followed by block formations (31.74%), and a small part (only 0.65%) is in linear stratum.

According to the Forest Sector Report, 2019 published by ICFRE, the average reported annual recorded production of timber from forest during 2010-11 to 2013-14 was only 1.94 million cum/per year. This constitutes a small portion of total consumption of industrial round wood which is estimated to be 65 million cum. Annual timber import being around 15 million cum, bulk of the demand is being met from ToF primarily the production in agroforestry systems. This clearly brings the focus on Agroforestry for production of wood required by wood-based industries to meet the growing domestic demand of wood products including paper and packaging, and in construction, furniture, handicraft and other sectors, and also exports.

However, there is no system for collecting/compiling/publishing authenticated national data on extent of agroforestry. Dhyani et al. estimated the area under agroforestry to be 25.32 mha (8.2% of TGA) based on an analysis of secondary data. This comprises of 20 mha in cultivated lands [7.0 mha in irrigated areas (11.23% of total irrigated areas) and 13.0 mha in rain fed areas (16.54% of total rain fed area)], 5.32 mha in other areas such as shifting cultivation, home gardens and rehabilitation of problem soils.

Ministry of Agriculture and Farmers Welfare is implementing a Sub-Mission on Agro Forestry (SMAF) under the National Mission on Sustainable Agriculture since 2016-17 to promote tree planting on farmlands. The scheme is being implemented in the 20 States and 2 UTs which have liberalized transit regulations for selected tree species {Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana and Uttar Pradesh and UT of Jammu

& Kashmir and Ladakh}. SMAF seeks to promote various agroforestry practices/models suited to different agro-ecological regions and land use conditions by planting trees on farmlands, peripheral and boundary plantations. This will also create additional income opportunities for farmers while contributing to mitigation of climate change impacts.

Considering the importance of agroforestry and afforestation of marginal/wastelands in achieving India's international commitments, national goal of one third of its TGA under forest/tree cover, and meeting the growing demand of wood and wood products it is proposed to conduct a questionnaire survey to understand the perceptions of policymakers and implementers on agroforestry and restoration of degraded forest landscape in India, and related opportunities and challenges.

## **Bonn Challenge**

The Bonn Challenge is a global goal to bring 150 million hectares of degraded and deforested landscapes into restoration by 2020 and 350 million hectares by 2030. This target to cover 350 million hectares of degraded land by 2030 was later extended at the New York Declaration on Forests of the 2014 UN Climate Summit. IUCN is the secretariat for the Bonn Challenge.

The Bonn Challenge is an implementation vehicle for national priorities such as boosting landscape productivity, improving water and food security, conserving biodiversity, and combating desertification, while facilitating the implementation of existing international commitments including the Aichi Biodiversity Targets, climate change commitments under the

UNFCCC and the Paris Agreement related to emissions reduction from the forest and land-use sector, as well as the Rio+20 land degradation target.

Launched by the Government of Germany and IUCN in 2011, the Challenge surpassed the 150-million-hectare milestone for pledges in 2017. Currently, more than 70 pledgers from more than 60 countries are restoring 210 million hectares of degraded and deforested lands. The Bonn Challenge is an implementation vehicle for domestic priorities such as water and food security and rural development, while simultaneously helping jurisdictions contribute to the achievement of international climate change, biodiversity and land degradation neutrality.

Forest landscape restoration is the ongoing process of regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes. Modifications of natural habitats such as land conversion for agriculture also happen at a bigger scale. From 1980 to 2012, nearly 100 million hectares of tropical forests were converted to farmland. Selective logging impacted nearly 20% of the tropical forests globally between 2000 to 2005.

Thus, looking beyond small-scale projects to landscape level initiatives ensures that restoration interventions are effective and impactful. Forest landscape restoration is more than just planting trees - it is restoring a whole landscape "forward" to meet present and future needs so as to offer multiple benefits and land uses over time. Under this approach, opportunities for ecological restoration are present in vast contiguous forests, both protected and productive, and whose objective is to integrate economic functions into it. Forest landscape restoration is not restricted to forests alone but also extends to other landscapes as well.

At the United Nations Conference of the Parties (COP) 2015 in Paris, India also joined the voluntary Bonn Challenge and pledged to bring into restoration 13 million hectares of degraded and deforested land by 2020, and an additional eight million hectares by 2030. This was raised to target of 26 million ha by 2030 during the United Nations Convention on Combating Desertification Conference held in Delhi in September 2019. In 2020, MoEFCC sent a letter to Bonn Challenge Secretariat for inclusion of India's revised target. The revised target was also communicated at United Nations Forum on Forests (UNFF) in 2019 as India's Voluntary National Contribution towards achievement of target 1.3 and 6.3 of Global Forest Goals, under United Nation's Strategic Plan for Forests 2017-2030.

As given in the Annual Report of 20-21 of MoEFCC, a pilot project "Enhanced Capacity Building of Stakeholders and State Governments on Forest Landscape Restoration and Reporting Mechanism on Bonn Challenge" has been awarded to IUCN and the project is under progress. The project aims at capacity building of States for identification and prioritization of landscape for their restoration. Project also involves compilation of data to showcase country's achievements towards meeting our commitment of 13 mha forest landscape restoration by 2030 under Bonn Challenge pledge. Project will be implemented in five states of Haryana, Karnataka, Madhya Pradesh, Maharashtra and Nagaland.

A Committee under the chairmanship of Director General of Forests was constituted in 2019 to monitor the progress of IUCN's enhanced capacity on forest landscape restoration and Bonn Challenge in India project and provide guidance for effective implementation of project in the identified

States on pilot basis, and will also facilitate development of protocols for landscape prioritization and tools for monitoring and reporting. The Government of India has achieved restoration of more than 11.5 million hectares since commitment made in 2015 under Bonn Challenge.

The Green India Mission, one of the eight Missions under National Action Plan on Climate Change (NAPCC) is a major step towards safeguarding the biological resources of our nation. GIM has been operational since 2015-16. along with the associated livelihoods against the advance perils of climate change. It aims at contributing green recoveries and improving quality of forest and ecosystem services including biodiversity, hydrological services, provisioning of fuel, fodder, timber and NTFP. The mission aims to increase tree cover on 5 million hectares of forest or non-forest lands and improve quality of forest cover on an additional 5 million hectares (a total of 10 million hectares), while increasing the forest-based livelihood income of about 3 million households living in and around the forests.

Under the Green India Mission, so far, a sum of Rs. 492.20 Crores (till December 2021) have been released to fifteen States namely Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Himachal Pradesh, Karnataka, Kerala, Manipur, Mizoram, Odisha, Punjab, Uttarakhand, Madhya Pradesh, Maharashtra, Sikkim, West Bengal, and one union territory Jammu & Kashmir for undertaking the afforestation activities over an area of 1,84,161 ha including forest and non-forest area which is contributing to enhance annual carbon dioxide sequestration. The afforestation and reforestation activities being undertaken using compensatory afforestation funds will go a long way in ensuring help achieving the Bonn challenge.

Planting trees in the degraded sites, to improve the quality of trees to adapt to the local conditions and harbour biodiversity, silvicultural practices like thinning, enrichment planting, reducing fire and grazing, removing invasive species among other practices, assisting natural regeneration and support of the local community are essential ingredient for forest restoration.

## **Conservation of Wetlands**

A wetland is an area of land that is saturated with water either permanently or seasonally. Wetlands can be freshwater, brackish (partly salty), or saline (very salty). These are valuable ecosystems occupying about 6% of the world's land surface but contain about 90% of the fresh water in liquid form. They provide a host of ecosystem services which are vital for human wellbeing and survival. Wetlands provide a multitude of benefits, including, major source of freshwater, filtering our water, buffering flood and drought, ground water recharge, supporting and ensuring biodiversity and livelihood of millions of people, cultural value, protecting our coastlines, and mitigating climate change.

Certain important Values and Functions of Wetlands are as under:

- Kidney of the Earth- Wetlands act as kidney by filtering the polluted water and make them clean. East Kolkata Wetlands treat 600 ml of sewage daily, generating employment for 20,000 families
- Regulate water regime and hydrology- High altitude wetlands of Himalayas are source of 10 largest rivers of Asia (Himalayan water tower).
- Loss of wetlands make urban landscapes vulnerable- Floods

of Guwahati would be much worse if DeeporBeel did not accommodate high flows (Flood Buffering). The recent flood in cities like Chennai, Mumbai, Srinagar are due to loss of wetlands.

- Prevent Saline intrusion- Help in maintaining freshwater wedge.
- Climate Change Mitigation- Act as carbon sink- Mangrove marshes can store up to 50 times more carbon than tropical forests
- Kalinga Super Wetlands buffer extreme climate events- During the Super Cyclone in 1999 and Tsunami in 2004, villages located behind mangroves were protected
- Cultural Value- Festival of Chaath in North India is a unique expression of association with wetlands. Temple and village ponds are used for a number of rituals.
- Support Tourism- Backwaters of Kerala are visited by over one million tourists annually
- Support Biodiversity- Wetlands are known for rich biodiversity. Freshwater species play an impact role in maintaining water quality and health of the ecosystem. The role of freshwater mollusks and other species in maintaining good water quality is well documented. Loktak Lake in Manipur provides habitat for a number of endangered and endemic species. It is the last natural habitat for Manipur Swamp Deer. Chilika - One of the largest lagoons in the world besides being a habitat and nesting ground for more than a million resident and migratory birds also supports a healthy resident Irrawaddy Dolphin population. High Altitude Wetlands of Ladakh - only known Indian breeding site for Black necked crane.

- Wetlands provide a diversity of habitats for water birds to meet their dietary needs, with many being either fish-eaters (piscivores), plant eaters (herbivores), or invertebrate feeders. Migration is an intriguing feature of several water bird species. Just as a global traveler needs hotels and restaurants as stopovers while travelling long distances, so do the water birds need their natural equivalents i.e., wetlands. Migratory water birds use wetlands as stopover sites for feeding, resting during migration.

Unfortunately, the wetlands are getting degraded all over the world at an alarming rate; at a rate faster than any other ecosystem. Nearly 90% of our wetlands have vanished and we continue to lose wetlands three times faster than forests. We must appreciate and value what wetlands do for water by harvesting, storing and using it.

Wetlands are degrading mainly due to

- Encroachment and conversion for other use
- Fragmentation
- Catchment degradation
- Pollution
- Invasive species

### **Ramsar Convention**

Being concerned with the rapid loss and degradation of wetlands Ramsar Convention for conservation of wetlands came in 1971. It provides a framework for conservation and wise-use of wetlands and 170 countries have joined the convention. It recognizes stakeholders' participation as a critical element for success of wetland conservation and management, therefore, emphasizes on building partnerships and engagement with local

communities. Participatory management is essential for sustainable management of wetlands. Wetland management planning that is inclusive has a much better chance of success. The long-term success of any management plan is dependent on the understanding of, and support for, management goals among the stakeholders.

Unfortunately, the importance of conserving wetlands has really not sunk in properly. Many think wetlands are wasteland and some even believe that these are breeding grounds for mosquitos, flies and other vectors that spread disease. So often there is a pressure to drain, fill-in or convert those to other uses. Therefore, it is essential to educate people on the importance of conserving wetlands. India has put in place the Wetlands (Conservation and Management) Rules, 2017 to regulate and manage wetlands. Earlier in 2010 the prevailing Rules provided for a Central Wetland Regulatory Authority, but new Rules of 2017 replaced it with state-level bodies and created a National Wetland Committee, which functions in an advisory role. The new rules stipulate setting up of a State Wetlands Authority in each State and union territories that will be headed by the State's environment minister and include a range of government officials.

### **Revival of Chilika Lagoon a Success story:**

Chilika, the largest brackish water lagoon in the world, sprawling over 1,100 sq. km. is connected to Bay of Bengal through a narrow mouth. Besides the rivers Daya and Bhargabi, 43 rivulets drain into it, as a result there is a salinity gradient, from freshwater to saline, thus has a very unique and diverse ecosystem. In 1981, Chilika had the honour of being designated as the first Indian wetland of international importance under

the Ramsar Convention. In the 1980s it was facing two major ecological problems:

1. Due to geological reasons, the mouth connecting Chilika with the sea was gradually shifting northwards and getting closed,
2. The rivers draining into Chilika were depositing heavy silt load into the lagoon resulting in shrinking of water spread and drop in salinity.

Government of Odisha, to address these issues constituted Chilika Development Authority (CDA) in 1991. The situation was alarming and environmentalists speculated that soon Chilika would turn into a fresh water swamp and ultimately dry up. In 1993 it was put in the Montreux Record (Threatened list) due to changes in its ecological characters by Ramsar Convention. Chilika was all set to be doomed!

Dr. Ajit Patnaik my batchmate and friend joined CDA, research work was going on how to save Chilika. It was a gigantic task to prepare an action plan to save Chilika, if at all it was possible. The challenge was to open a new mouth, restore the salinity gradient and remove the huge silt load and fresh water weeds. CDA, after engaging with Central Water and Power Research Station (CWPRS), Pune decided to open an artificial mouth at a location 11kms from the lake on the southern end. Initially, there was a lot of reluctance, some environmentalists predicted ecological disaster, in view of such a massive intervention. Finally, after a lot of deliberations, scientific consultations and persuasion by CDA, State Government decided to engage IIT, Madras to execute the project. History was made on 23 October 2000; a new mouth was dredged open.

The intervention had spectacular impact. The new mouth facilitated exchange of fresh and saline water and the desired salinity gradient was restored. Freshwater invasive weeds disappeared and the seagrass meadows revived. Biological diversity got restored and native fish species started reappearing. CDA also excavated natural channels and silted up areas to restore the lake back to its original shape. The annual fish landing, which was about 8,000 MT in 1980 and had plummeted to 2,000 MT in 1999, went up by seven times to 14,000 MT (a staggering annual turnover of Rs.160 crore). Livelihood of 33,000 fisher families from 160 villages around Chilika, which entirely depended on fishing and other allied activities was restored. Chilika got the unique distinction of being the first entity from Asia to be removed from the Montreux Record in 2002 by Ramsar Convention and CDA was conferred with prestigious Ramsar Wetlands Conservation Award (1<sup>st</sup> from Asia) and Indira Gandhi Paryavaran Award.

Irrawaddy dolphin is a flagship species of Chilika. Being a fish-eating species, its population has direct correlation with availability of fish. With increase in fish population, dolphin population which had dipped to a mere 45 prior to opening of the mouth, increased to about 150. The beach at the point of confluence of the new mouth and dolphin sightings attracted a lot more tourists. Prior to 2000, there were only 220 tourist boats operating, the number went up beyond a thousand. Chilika one of the major habitats for birds, particularly, the migratory ones bounced back as a safe haven and the bird population stabilized at around 10 lakhs. Eco-tourism is now the buzzword of Chilika. Ancillary activities in and around it flourished. Chilika has emerged as a global role model for Eco-restoration!

Ajit directly remained associated with the affairs of Chilika for two decades till he retired in April 2017 except for a brief intervening period. He is now counted in the top three wetland experts of the world, extensively travels to different countries for sharing and disseminating knowledge in the field. He is representing Asia as a scientific committee member of International Lake Environment Committee Foundation (ILEC) Japan. He is the Vice Chairman of Wetlands International South Asia, Senior Scientific Consultant to National Center for Sustainable Coastal Management. Now he is working as environmental and governance expert for the 10-year-long World Bank's "Dam Rehabilitation and Improvement Project" in India.

### **Carbon Sequestration by Algae- A Pilot Project at NALCO**

Several efforts are also being made for taking up mitigative measures for abatement of adverse impacts of Climate Change at micro level. During my tenure as Member Secretary, Odisha State Pollution Control Board, I was involved in preparation of the State Climate Change Action Plan. During my work on it, I developed keen interest on sequestration of carbon dioxide emitted from Thermal Power Plants (TPP). A typical thousand-megawatt TPP generates more than 16,000 tons of carbon dioxide every day. I realized the best approach to reduce emission is direct absorption or sequestration of carbon dioxide which is only possible by biological entities through photosynthesis. On land one hectare of well managed plantation can annually absorb about 2.5 tons of carbon dioxide and it can be a bit higher in tropics. Which means, we would need minimum of 19,200 sq km land or roughly 12.5% of total area of Odisha to absorb carbon dioxide generated by only one such

TPP by afforestation. Therefore, we need to think beyond trees. Coincidentally, at that point of time Prof. Ranjan Pradhan visiting from Guelph University, Canada made a presentation before me on “Potential of Carbon Sequestration by Micro-algae in Thermal Power Plants”. He explained:

- (i) Microalgae has potential of sequestering carbon dioxide at a rate of 100 times than that of standard plantation.
- (ii) Carbon dioxide tolerance of microalgae is 1000 time that of trees and
- (iii) Tree growth can be enhanced by maximum 3 times in a carbon dioxide enriched environment compared to 10 to 20 times by Algae.

He claimed to have achieved this under laboratory conditions and wanted to experiment in the field. He proposed to take up a pilot project and grow microalgae in shallow ponds by enriching the water with carbon dioxide channelized from TPPs. I was quite impressed with his proposal and persuaded NALCO, a major Public Sector Undertaking producing aluminum, to take up a pilot in their TPP at Angul. I am grateful to NALCO's authorities that they allocated one-fifth acre of land close to their TPP. We started the pilot project on 3 November 2010 and completed it on 31 March 2013.

In the pilot project we achieved an average carbon dioxide sequestration of 80 ton/ha/year and a peak sequestration of 150 ton/ha/year compared to 250 ton/acre/year under laboratory conditions. This was something remarkable, particularly, given the conditions under which we worked. Prof. Pradhan was confident that we could have easily achieved an average of at least 125 ton/ha/year. Besides reducing emission, the biomass produced in the process could

be used to produce a range of bio-refinery products like, bio-oil, fodder, pharmaceuticals, etc. He established potential for few downstream products like biofertilizer, biocarbon from the biomass of NALCO pilot plant. The spectacular results achieved in the Pilot Project, first of its kind globally, were presented at two international seminars and at leading institutions like Los Alamos National Laboratory USA, Carbon Sequestration Centre, USA and were highly commended by experts in the field from world over. The results have also been published in International scientific journals. Without getting into the mathematics of it we can safely conclude:

1. Sequestration at-source (place of carbon dioxide generation) is the best and only sustainable technology for large scale carbon dioxide sink technologies
2. If the pilot project is up-scaled to 5-acre plots in 10 TPP, 1500 tons of Carbon Neutral Coal equivalent can be generated, equivalent to 3000 MWh or 3 Giga Watt hour energy. I hope sooner rather than later, full-fledged projects will be taken up.
3. A cleaner and more concentrated source of carbon dioxide can support more value addition of the biomass and positive revenue generation to make carbon dioxide sequestration a business model rather than an environmental remediation measure.

When I was posted as Director General of Forests in the MoEFCC, I made a presentation on this before the Secretary and officers from the Environment wing. They initially showed keen interest but somehow nothing much progressed. Prof. Pradhan returned to Canada and joined back in the University and continued working for sustainable technologies and circular

economy. But suddenly in 2021, Prof. Pradhan called me and told that German Aerospace Agency has floated a project for manufacturing 3D printed Silicon Carbide (SiSiC) ceramic prototype using unique biocarbon obtained from micro-algal biomass by this technology. SiSiC is a carbon negative product (carbon from this cannot be released to the atmosphere and is permanently locked). Microalgae biomass produced by sequestering carbon dioxide from flue gas is extremely suitable for this purpose. He coordinated with IIT, Kharagpur and Jindal Steel and Power Limited (JSPL) to bid for this Indo-German joint venture pilot project and was successful in getting it. He has now shifted from Canada and has joined JSPL to lead this pilot project.

There are certain distinct advantages of working with JSPL. First, the mega steel producers use coal gasification technology, which is more climate friendly. In the process carbon dioxide is concentrated before being released to the atmosphere. Therefore, the percentage of carbon dioxide in the flue gas is about 90 percent compared to 12 to 14 percent in flue gas emitted from a normal TPP. Utilization of flue gas having high concentration of carbon dioxide is more suitable for accelerated production of microalgae. Second, in coal gasification process good amount of ammonia is produced, which is a necessary ingredient for producing microalgae. Third, and the most important is that Mr. Naveen Jindal, Chairman of the group is very keen and committed to make his steel green with sustainable technologies. Normally, during the process of producing one ton of steel two tons of carbon dioxide is released. If the carbon footprint is halved it would be a stupendous achievement and become a catalyst for bringing change to world's most needed immediate global environmental

challenge. Mr. Jindal has an ambitious target of sequestering one million ton of carbon dioxide annually and this can lead the path for others to reach to much needed Giga Ton sequestration scales for global GHG remediation. This scale would require huge capital investment and would require lot of dedicated land, and I think it may not be possible immediately to do so but for sure have potential in near future. This definitely is an extremely good initiative in the right direction. Prof. Pradhan has already started working on the Indo-German pilot project and is in the process of preparing blueprint for contributing towards greener steel at JSPL.

The dynamic, delicate and intricate balance amongst the entities of all the ecosystems of the earth stand critically threatened due to global warming. Unless concerted efforts are taken up immediately for conservation of the natural systems, both at macro and micro levels, we would hurtle towards decimation of the only known living planet sooner than later.

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## Webinar Presentation

# Elephant Management in Keonjhar Forest Division

(Presented by Arun Kumar Mishra on 02. October 2022)

### Authored by:

*Dr. Arun Kumar Mishra, Regional Chief Conservator of Forests, Rourkela*

*Mr. Dhanraj Hanumant Dhamdhare, Divisional Forest Officer, Keonjhar*

*Mr Ghanshyam Mahanta, Assistant Conservator of Forests, Keonjhar*

*Mr Ashok Das, Assistant Conservator of Forests, Keonjhar*



Dr. Arun Kumar Mishra

Wildlife management prescribes regulating interactions among and between wildlife, its habitats and people, aiming to achieve predefined impacts. It attempts to balance the needs of wildlife with the needs of people using the best available knowledge while considering the ecological principles such as carrying capacity of the habitat, preservation, and control of habitat. Management of elephants in Keonjhar Forest Division is aligned with this principle.

The Keonjhar Forest Division lies between 21° 11' N to 22° 16' N Latitude and 85° 18' E to 86° 08' E Longitude having geographical area of 6268.56 Sq. Km. For administrative convenience, the division has been sub divided to seven Ranges, 25 Sections and 105 Beats. The Latitude / Longitude of Keonjhar

Forest Division headquarters is  $21^{\circ} 38' 10.94''$  N &  $85^{\circ} 36' 27.98''$  E. The headquarters of Keonjhar Division is situated in the heart of Keonjhar town. Karo- Karampada Elephant corridor and Telkoi-Pallahada Elephant Corridor are two identified paths for elephants where the former has become less functional over the last few years.

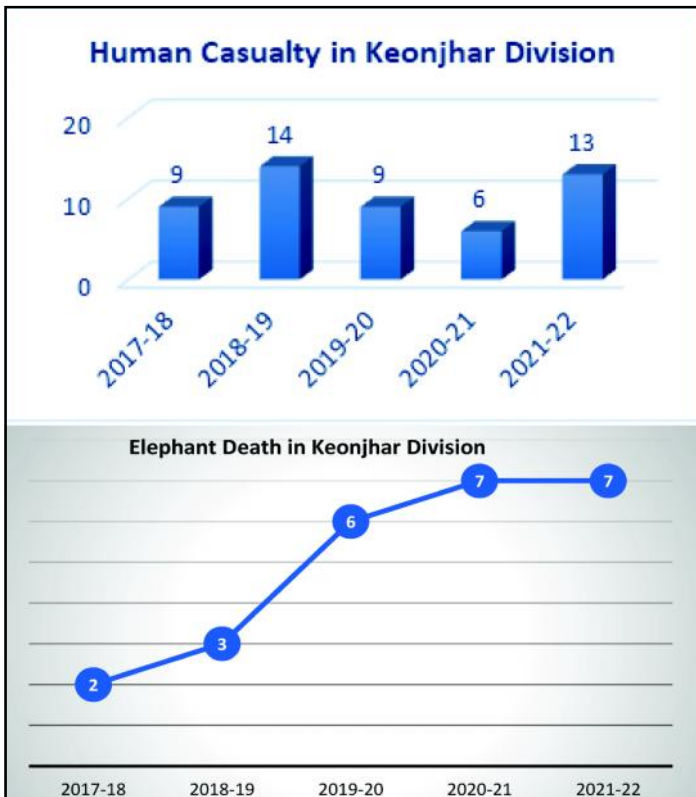
The state of Odisha has about 72% of the elephant population in the eastern region of India which is also about 7% of the Indian elephant population. Forests of Keonjhar Division harbours around 130 elephants out of which 40 are bull, 60 are cows and 30 are calves. Over the past couple of years their number has remained constant, despite rise in mining and industrial activities. Distribution of elephant is mainly observed in the forest ranges of Champua, BJP, Keonjhar and Telkoi Range in this division. Now a days Ghatagaon and Patna Ranges are experiencing elephant footfall in a noticeable manner.

As a result of rapid increases in anthropogenic activities in elephant range areas in the past decade, the human-elephant conflicts have become a major problem for wildlife managers in Odisha. Expansion of human settlements, agricultural fields across Odisha and mining activity in a few districts has resulted in widespread loss of elephant habitat, degraded forage, reduced landscape connectivity, and a stress on elephant populations relative to their historical size and overall range. On this backdrop elephants in Keonjhar division are managed with the following objectives:

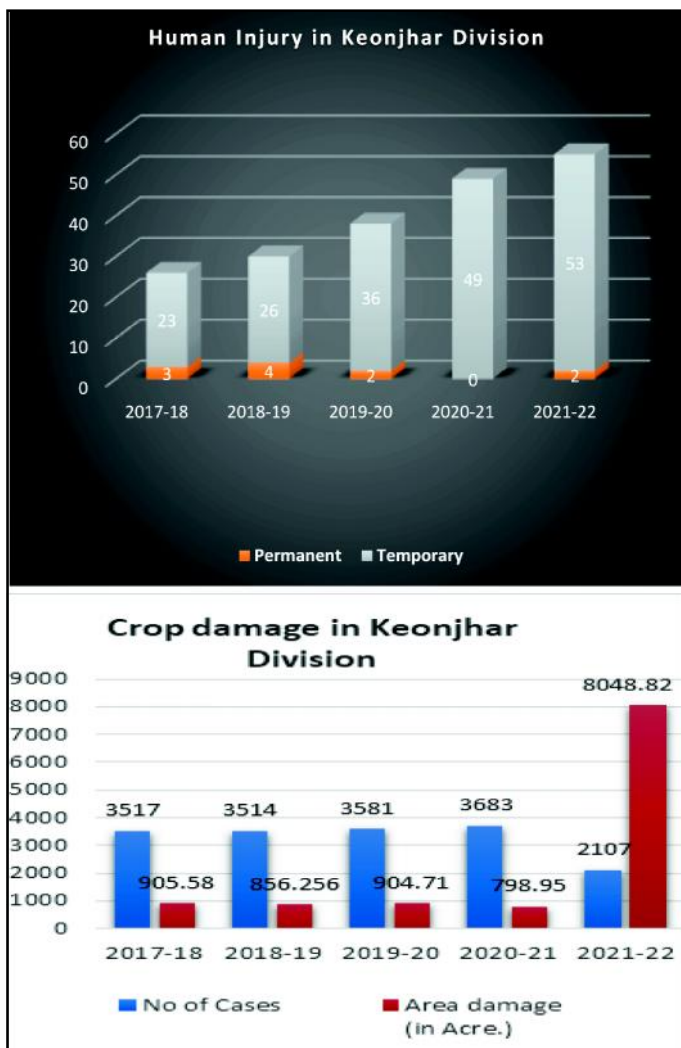
- To Conserve, protect and improve existing elephants and their habitat.
- To enhance biodiversity and population in this landscape.
- To involve people in its management and associate them in preventing crime against them.

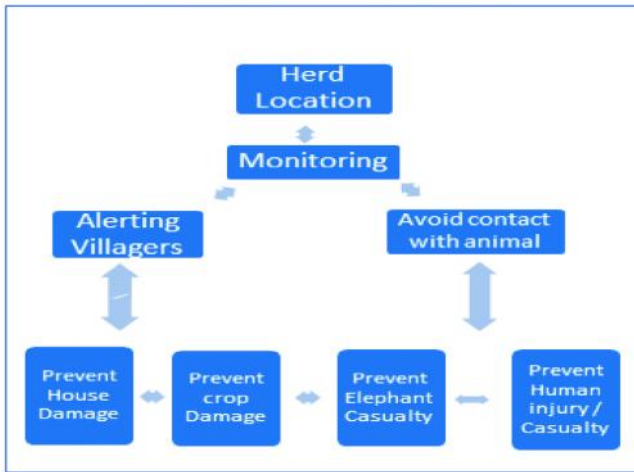
- To build up scientific knowledge on elephants in the division.
- To train personnel at various levels to handle elephant depredation.
- Carryout research relevant to management including the development of techniques appropriate to local conditions.
- To educate people on elephant and the need for their conservation.
- To protect life and properties of public against depredation.

As habitats shrink, elephants are progressively forced into closer contact with people, resulting in more frequent and severe conflict over space and resources with consequences ranging from crop raiding to reciprocal loss of life.



In the last few years human casualty are occurring in a cyclical manner and its reason is assigned to variation in the yield of MFP items in different years. A better crop attracts more forest fringe villagers to forest which ends with more encounters with jumbos and major death incidents in the wee hours. In fact, the average age of death victims due to elephants is above 50 years. The number of death is slightly skewed towards females.





*Strategy to prevent /mitigate human-elephant interface and reduction of losses to life and property*

Death of elephants in Keonjhar division are functions of railway track accident, electrocution, and disease. Rapid rural electrification with maintenance constraints and rise in number of wheels on rail tracks has contributed towards jumbo fatalities. For last couple of years *Clostridium hemolyticum* has become the

main culprit. However, this death curve is now moving on a platykurtic zone with active time bound intervention by field functionaries. [*Clostridium haemolyticum* is a sporulating Gram-positive anaerobic rod that is considered to be one of the most fastidious and oxygen-sensitive anaerobes. It is a well-known animal pathogen and the cause of bacillary hemoglobinuria primarily in cattle.... Google]

Industrialisation, rise in mining activity, agriculture of hybrid crops has led to more frequent visit of elephants in human habitation and end up with rise in injury, house damage and crop damage incidents. Evolutionary cum behavioural change with affinity for carbohydrate crop and more human tolerance are the driving factors of it. Management of Jumbos causing house damage is done with identifying each herd and tagging it with an alpha-numeric value for easy recognition. While managing the jumbo, each herd is assigned to a dedicated team of staffs for 24x7 in a shift wise manner. Movement as well as herd composition is recorded and uploaded in iWLMS digital platform. At the Division level a control room functions round the clock that coordinates field with headquarter and line departments like railways and electricity department.

All elephant monitoring vehicles during day and night times are monitored through e-Trans technology in which real time location of vehicle can be traced from control room or mobile team. A mobile squad involving 12 two-wheeler vehicles fitted with siren remain deployed for awareness and to penetrate deep into the farm fields and forest for close monitoring.

Early warning is very vital in avoiding contact of villagers with elephant. This is done in the afternoon when position of each herd is ascertained, and a dedicated team is assigned to it at range level. That team monitors the herd as well as gives alert message to nearby villages through miking. From Divisional

control room, alert messages in the form of bulk SMS via Gup Chup messaging service and voice message are also sent to nearby villagers, people representatives, and line department officers to avoid confrontation with elephants.

While managing the elephant, the monitoring team has to complete the reconnaissance survey of locality for presence of possible danger to animals like tilted electric poles, sagged conductors, damage insulators, open electrical transformers etc well in advance. Accordingly, electricity staff/authorities are intimated to rectify the same in time and in extreme cases power supply is snapped to that area.

To have close coordination with the team members, dedicated WhatsApp group are maintained, and all communications are done in a real time manner. In Keonjhar Division elephant landscape is very often crisscrossed with NH -20, 49 and 520, as well as the railway line from Jamkhundia to Harichandnpur having jurisdiction of both South Eastern Railway and North Eastern Railway. National Highways had witnessed a few accidents in past years and to avoid it highway patrol squads are deployed at Badaposi, Masanibilla and Basudevpur area. To avoid casualty on railway tracks, monitoring teams do regular patrolling with railway officials along the sides as well as on the tracks.

For easy passage of elephants on National Highways, under passes are provided at seven locations in Keonjhar Division. These under passes are cleaned regularly and enriched with plants like ficus, banana etc to attract elephants.

Movement of elephant is regulated through selective artificial barriers like solar fencing, trench etc in localities that pose danger to both elephant and humans. Solar power hanging fencing is provided at Creche hutting and elephant proof trench at Behera hutting is dug up along and across accident prone

routes and funnelled towards a safer location for safe passage of elephant. (Huttings are different small houses in the locality).

Regular coordination meeting is held with Railway, Electricity, NHAI and Veterinary authorities to review the past action as well as chalk out future strategies to prevent elephant related casualties.

While managing the elephant herds and diverting them out of vulnerable zones, vehicles are used for effective and safe monitoring. Each vehicle is fitted with GPS devices to give real time locations and subsequent control through division control room.

As disease related deaths are reported in last few years, prophylactic measures like sanitisation of water bodies in elephant landscape are done regularly. Vaccination for BQ (Black Quarter), HS (hemorrhagic septicemia), Anthrax and FMD are done regularly in forest fringe villages. Regular dung samples are tested and analysed at district diagnostic laboratory to assess the endo-parasitic load.

A dedicated 'Gajah Rescue Vehicle' equipped with all modern equipment including tranquilisation kits is in place along with a dedicated veterinarian of WTI (Wildlife Trust of India, New Delhi) at Keonjhar HQ to respond to any disease and accidents related to elephants.

An informer incentive module is in place at division and range levels where information is collected, collated, analysed and inferred to prevent subversive poaching activities in elephant landscape. For this, incentive to informer is paid from a secret fund and the whole process is kept confidential.

Speeding heavy goods vehicle on three national highways namely NH 20, NH-49 and NH-520 of Keonjhar division are potential threat to elephants. Vulnerable stretches on these roads

are provided with warning signages, speed limit cautions and virtual ramblers for safety of Jumbos. Even the stretches at Kandra, Basudevpur of NH 520 and Anjar of NH-49 are declared as no parking zones for unhindered movement of elephants.

Monsoon patrolling is one of the strongest deterrents to poaching inside forests. It is carried out at inter-division and intra-division level on regular manner in monsoon.

Social capital about elephant conservation among society especially among children's and youth is very critical for near future as man elephant conflict would further escalate. For adults it is being done through monthly VSS meetings and range level VSS forum meetings.

For sensitizing children and youths, an innovative awareness scheme "MO JANGAL MO PARIBESH" is launched in Keonjhar in which "Van Shikshak" take classes in schools and colleges about forest and wildlife especially elephants, focussing on local issues. These van shikshaks include Forest Guards, Foresters, Range Officers, ACFs and DFOs.

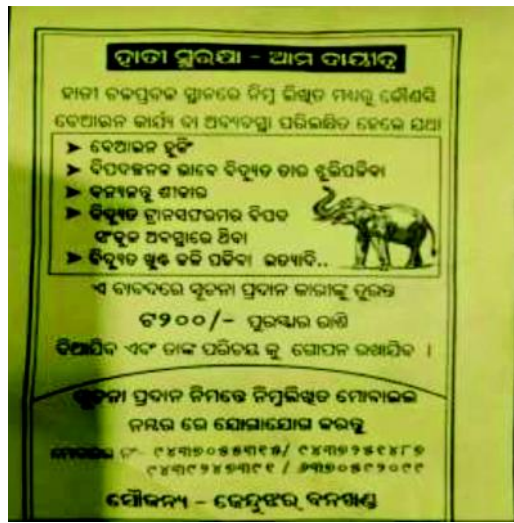


Now a days human-elephant conflict has become a threat to biodiversity conservation, and the management of such conflict is a primary goal for elephant conservation in range landscapes. Research plays a vital role in shaping the

management goals. Dr Mukti Roy of Nature Research and Conservation Centre (NRCC), is doing research on habitat assessment of Asian elephant for further landscape enrichment. Zoological Survey of India (ZSI) Kolkata soon would be engaged for faunal and floral studies at the landscape level in Keonjhar.

G r o w i n g understandings of wildlife behaviour and spatio-temporal patterns of human-wildlife conflict have led to the suggestion,

development, and adoption of a wide variety of prevention and mitigation approaches. Current management approach focuses on prevention through exclusion and on-site deterrents, and mitigation via elephant monetary compensation for losses. However, these management approaches will merely address the symptoms, if we do not consider the underlying drivers of human-elephant conflict associated with cultural values, resource use decision-making, and the increasing fragmentation and isolation of elephant populations.





# ‘ମାନବ-ହାତୀ ବିବାଦ - ପ୍ରସଙ୍ଗ ଏବଂ ଆହ୍ୱାନ’ ଶୀର୍ଷକ ଓଡ଼ିବିନୀର

**ଭୁବନେଶ୍ୱର, ୩୧୦/ଏନ୍-ଏନ୍-ଏସ୍:**  
 ବନ୍ୟଜୀବ ସମ୍ରାହ ପାଳନ ଅବସରରେ ଓଡ଼ିଶା ପରିବେଶ ସମିତି (ଓଇଏସ୍) ପକ୍ଷରୁ ‘ମାନବ-ହାତୀ ବିବାଦ - ପ୍ରସଙ୍ଗ ଏବଂ ଆହ୍ୱାନ’ ବିଷୟବସ୍ତୁ ଉପରେ ଏକ ଓଡ଼ିବିନୀର ଆୟୋଜିତ ହୋଇଯାଇଛି । ଏହି କାର୍ଯ୍ୟକ୍ରମର ମୁଖ୍ୟ ଅତିଥି ଭାବେ ଆଞ୍ଚଳିକ ମୁଖ୍ୟ ଜଙ୍ଗଲ ସଂରକ୍ଷକ, ରାଉରକେଲର ଡ. ଅରୁଣ କୁମାର ମିଶ୍ର ଯୋଗଦେଇ ସାରା ରାଜ୍ୟରେ ହାତୀମାନଙ୍କର ଗତିବିଧି ଏବଂ ସେମାନଙ୍କର ଅସ୍ୱାଭାବିକ ମୃତ୍ୟୁର ବିଭିନ୍ନ କାରଣ ଉପରେ ଆଲୋଚନା କରିଥିଲେ । ଏହି ସ୍ତନ୍ୟପାୟୀ ପ୍ରାଣୀମାନେ ମାନବ ବସତି ଆଡ଼କୁ କାହିଁକି ଆକର୍ଷିତ ହୁଅନ୍ତି, ଯାହା ସେମାନଙ୍କୁ ଲୋକଙ୍କ ସହ ମୁହାଁମୁହିଁ ହେବାର ପରିସ୍ଥିତି ସୃଷ୍ଟି କରେ ଏବଂ ଧନ ଜୀବନ ହାନି ଘଟାଏ, ତାହା ସେ ବର୍ଣ୍ଣନା କରିଥିଲେ । ଆହତ ତଥା ରୋଗଗ୍ରସ୍ତ ବନ୍ୟଜନ୍ତୁଙ୍କ ଚିକିତ୍ସା ପାଇଁ ଅଧିକ ଉଦ୍ୟମ କେନ୍ଦ୍ର ପ୍ରତିଷ୍ଠା ଏବଂ ବନ୍ୟଜନ୍ତୁ ସୁରକ୍ଷା କ୍ଷେତ୍ରରେ ପ୍ଲାନୀୟ ଲୋକଙ୍କର ଅଂଶଗ୍ରହଣ ଉପରେ ମଧ୍ୟ ସେ ଗୁରୁତ୍ୱରୋପ କରିଥିଲେ । ଏହି କାର୍ଯ୍ୟକ୍ରମରେ ଅଧ୍ୟକ୍ଷତା କରି ଓଇଏସ୍ ସଭାପତି ଡ. ସୁନ୍ଦର ନାରାୟଣ ପାଠୁ ଜଙ୍ଗଲର ସୁସଂରକ୍ଷଣ ବନ୍ୟଜନ୍ତୁଙ୍କ ବାସସ୍ଥଳୀର ରୁଣ୍ଡବଢ଼ା ବୃଦ୍ଧି

ତଥା ସେମାନଙ୍କୁ ପର୍ଯ୍ୟାପ୍ତ ଖାଦ୍ୟ, ଜଳ ଏବଂ ଆଶ୍ରୟ ଯୋଗାଇବା ପାଇଁ ଏକ ପ୍ରମୁଖ ଗବିକାଠି ରୂପେ କାର୍ଯ୍ୟ କରେ ବୋଲି କହିଥିଲେ । ସମ୍ପାଦକ ଡ. ଜୟକୃଷ୍ଣ ପାଣିଗ୍ରାହୀ ସ୍ୱାଗତ ଭାଷଣ ପ୍ରଦାନ କରିବା ଅବସରରେ ବନ୍ୟଜନ୍ତୁଙ୍କର କ୍ରମାଗତ ଅବନତିର କାରଣଗୁଡ଼ିକ ଉପରେ ଆଲୋଚନା କରିବା ସହ ଏହା କିପରି ମାନବଜାତି ପାଇଁ ଅମଙ୍ଗଳ ସୂଚକ ସାଧୁତ ହେଉଛି ତାହା ବର୍ଣ୍ଣନା କରିଥିଲେ । ବନ୍ୟପ୍ରାଣୀ ବୈଜ୍ଞାନିକ ଡ. ଲାଲା ଏକେ ସିଂହ ବନ୍ୟଜନ୍ତୁମାନେ ସମ୍ବୃଦ୍ଧୀନ ହେଉଥିବା ବିଭିନ୍ନ ପ୍ରସଙ୍ଗରେ ଅଧିକ ଗବେଷଣା କାର୍ଯ୍ୟକ୍ରମ, ନିର୍ଦ୍ଦିଷ୍ଟ ଭାବରେ ବିପଦଗ୍ରସ୍ତ ପ୍ରଜାତିଗୁଡ଼ିକ ଉପରେ ଗୁହଣ କରାଯିବା ଆବଶ୍ୟକ ବୋଲି ମତ ବ୍ୟକ୍ତ କରିଥିଲେ । ପୂର୍ବତନ ପିସିସିଏଫ୍ ଡ. ବିଜୟ କେତନ ପଟ୍ଟନାୟକ ‘ବିବାଦ’ ବଦଳରେ ‘ଆଦାନପ୍ରଦାନ (ଇଣ୍ଟରପ୍ରେସ୍)’ ଶବ୍ଦର ବ୍ୟବହାର ନିମନ୍ତେ ମତ ପ୍ରକାଶ କରିଥିଲେ । କାରଣ ପ୍ରାକୃତିକ ବାସସ୍ଥଳୀରେ ଜୀବନଯାପନ କରୁଥିବା ବଣୁଆ ଜାତିର ପ୍ରାଣୀ ସହିତ ମଣିଷ ସଂଘର୍ଷପୂର୍ଣ୍ଣ ସମ୍ପର୍କ ପରିବର୍ତ୍ତେ ସୁସଙ୍ଗତ ସମ୍ପର୍କ ରଖିବାକୁ ଇଚ୍ଛା ପ୍ରକାଶ କରିବା ଉଚିତ ବୋଲି ସେ କହିଥିଲେ । ଡ. ପ୍ରତୀଭା କୁମାରୀ ନବ ଧନ୍ୟବାଦ ଦେଇଥିଲେ ।

WILDLIFE WEEK OBSERVED

# 'People's participation must for wildlife protection'

OST NEWS NETWORK

**Bhubaneswar, Oct 3:** As human civilization is progressing forward, conflicts between human beings and other creatures existing in natural ecosystems are increasing by the day. Consequent to such conflicts, these creatures are getting reduced in numbers and their habitats are getting shrunk by the detrimental impacts of human activities.

In the context of elephants, the conflict is reaching greater heights bringing about casualties at both ends. At present, the elephant population of the world, including Asian and African species, has shrunk greatly to a meager number of four lakhs only.

Though India has nearly 7,000 elephants left in the wild and Odisha's share is 1,976, around 500 people and 100 jumbos get killed annually across the country.

The environment and wildlife experts participating in a webinar organized by the Orissa Environmental Society (OES) on the occasion of the wildlife week observation expressed dismay at such occurrence. They expect that human wisdom will prevail in making a revolutionary change in our behaviour towards other living organisms.

The webinar was held on the theme 'human-elephant conflicts issues and challenges'. The chief guest of the programme was



Though India has nearly 27,000 elephants left in the wild and Odisha's share is 1,976, around 500 people and 100 jumbos get killed annually across the country

Arun Kumar Mishra, Regional Chief Conservator of Forest, Rourkela. He shed light on elephant movements across the state and various causes of their unnatural death. He narrated why these mammals are attracted towards human habitation that culminates in confrontation with people and loss of life as well as property. He emphasized on establishment of more rescue centres for treatment of injured and diseased wild animals, and enhanced people's participation in

wildlife protection.

Chairing the programme, president of OES, Sundar Narayan Patro opined that conservation of forests is crucial to enhance the quality of wildlife habitats.

The secretary Jaya Krushna Panigrahi, while presenting the welcome address, explained how multiple causative factors are contributing to the steady depletion of wildlife, which is ominous for the mankind. Lala AK Singh, wildlife scientist emphasized on undertaking of research programmes on various issues confronting the wildlife, more specifically on species which are threatened.

Bijay Ketan Patnaik, former PCCF suggested for substituting the word 'conflict' with 'interface' as humans should not intend to have incompatible relation with wild species living in natural habitats.

Webinar on 04 September 2022

## **New Education Policy (NEP 2020) vis-à-vis Environmental Education**



### **Prof. Siba Prasad Adhikary**

Former Vice-Chancellor, F.M. University;  
Former Professor of Biotechnology, Visva-  
Bharati, Santiniketan;  
Former Professor of Botany, Utkal University,  
Bhubaneswar;  
Email: adhikarysp@gmail.com

In an era of globalization and knowledge economy, education is the key to overall progress of a state/nation. Whatever be the arguments, education has proved to be the engine of social, economic, cultural transformation and there is no alternate to substitute to it. Hence improving the quality and inclusive growth of education to reach its goals is one of the priorities of the Government. Education is presently facing many problems of which the major one is lack of quality teaching-learning and research at higher level. Such problem is due to multiple factors which include lack of sufficient qualified and experienced teachers; inadequate faculty enrichment programs; out-dated curriculum and traditional pedagogy; inadequate technology integration and support facilities. The present world needs skills in youth which education can provide making them empowered and competitive. The only concern is the quality.

Effectiveness of empowering the youth is dependent upon its teachers at all levels with effective class room teaching

strategies, adoption of modern technologies in teaching and research, implementation of up-to-date curriculum par with global standard etc. This also depends on the commitment of teaching community at all levels, their competence and time-to-time training to update their knowledge base and expertise to become effective teachers. Quality of a teacher has a profound impact on the learning abilities of disciples. India has a legacy of great teachers from time immemorial. History tells the contribution of “Chanakya”, the teacher of Taxila from about 300 BC with the magnificent “Arthasastra” to that of Barahamihira, Bhaskar, Lilabati and many others in Mathematics, Astronomy and Ayurveda until late 1000 AD. The teacher centric gurukul system had showed the path in ancient times with clear description in epics like the Ramayan and the Mahabharat which was undreamt of in many countries which boost of providing quality education. We could not keep the pace due to foreign invasions and the colonial masters who stifled free thinking and creativity. The leaders of Indian freedom movement realized the fundamental role of education and stressed its unique significance for national development. Mahatma Gandhi formulated the scheme of basic education harmonizing intellectual and manual work with focus on education as directly relevant to the life of the people. In the post-independence period the Government of India and the states have constituted commissions to review educational reconstruction. The Education Commission (1948) constituted by Government of India, soon after independence under the chairmanship of Dr. S. Radhakrishnan stated that “if India is to confront the confusion of the time, she must turn for the guidance, not to those who are listed in the more exigencies of the passing hour, but to her men of letters, and men of science, to her poets and artists, to her discoverers and inventors. These

intellectual pioneers of civilization are to be found and trained in the universities, which are the sanctuaries of the inner life of the nation”.

During the third Five Year Plan the Government appointed the Education Commission (1964-66) to advise on “the national pattern of education and on the general principles and policies for development of education at all stages and in all aspects”. Late Dr. A.P.J. Abdul Kalam in his book “India 2020: A Vision for the New Millennium” wrote that “For transforming the nation into a developed county, five areas in combination have been identified based on India’s core competence, natural resources and talented manpower for integrated action to double the growth rate of GDP and realise the Vision of a Developed India. And the five areas are (i) Agriculture and food processing, (ii) Education and Healthcare, (iii) Information and Communication Technology, (iv) Reliable and quality electric power, Surface transport, Air transport and Infrastructure for all parts of the country, and (v) Self-reliance in critical technologies. These five areas are closely inter-related and if progressed in a coordinated way, will lead to food, economic and national security”.

The 12<sup>th</sup> Plan Document Places a significant emphasis on excellence along with expansion and equity. With this view, in the year 2015, Govt. of India initiated a consultative process for formulation of a new education policy for the Nation with an aim to implement it. The new Education Policy of Govt. of India places a significant emphasis on quality and excellence along with inclusiveness and equity. Rapid industrialization would require skilled work force. Given the socio-economic scenario, the state as well as the Central Government needed a robust higher education system that can deliver multiple imperatives.

**The Education Commissions to bring out policies at different times are as follows:**

1. University Education Commission (1948-49)
2. Secondary Education Commission (1952-53)
3. Education Commission (1964-66) under Dr. D.S. Kothari
4. National Policy on Education, 1968
5. 42<sup>nd</sup> Constitutional Amendment in 1976 in which Education brought under the Concurrent List
6. National Policy on Education (NPE), 1986
7. NPE 1986 Modified in 1992 (Program of Action, 1992)
8. New Education Policy (NEP) initiated: online suggestion in “MyGov.in” portal during May-October,2015; National Education Policy (217 pages) submitted by TSR Subramanian Committee on 30<sup>th</sup> April 2016.

But the national committee changed under Chairmanship of Dr. K. Kasturirangan in 2017. It conducted 11 meetings between 11 July 2017 to 4 June 2018 (3 at UGC and 8 at Bengaluru); Consultations made with 74 Institutes/Associations/Organizations; Consultations with 217 eminent persons and draft National Education Policy released on 31 May 2019 and opened for public comment. Finally National Education Policy-2020 notified on 29<sup>th</sup> July 2020. The policy had 27 points: 8 for school, 11 for Higher education, 5 for Professional, 3 Financial etc.

**Salient features of the National Education Policy**

**School education (up to secondary level):**

- Universalization of Early Childhood Care Education (ECCE) to Secondary level
- 100% Gross Enrollment Ratio in Pre-school to Secondary level by 2030

- [3 years in Anganwadi] from age three onwards+ 2 years (Fundamental course) + 3 (Preparatory level) + 3 (Middle level) + 4 (Secondary level)
- Medium of instruction till Class 5; preferably till Class 8 in mother tongue
- Vocational integration from class 6 (Age -11)onwards
- National Mission on Foundational Literacy and Numeracy
- Curriculum to integrate Skills, Mathematical thinking and Scientific temper
- Progress card of each child and Tracking progress and learning outcome
- Board examinations to test core concepts and application of knowledge
- Teachers (including Anganwadi) to be prepared for reforms
- Every child come out of school adept in at least one skill for livelihood
- Digitally equipping schools, Teachers and Students
- Common standards of learning in Public and Private schools

## **Higher Education**

- Under-Graduate Course: Multi-disciplinary; Choice Based (Humanities, Language, Science, Commerce, Teacher's education, Sports education, Skill, Vocational etc); 4 years course (3 years + 1 year Project work or 4 years; Teacher's education course in the college: 4 years /2 years/ 1 year mode.
- Post-Graduate Course : 2 years course with 1 year Project work; If 1 year project undertaken at UG level = 1 year course; or UG and PG 5 years integrated course (like IISER/ NISER etc.)

- Other criteria: Academic credit bank and Credit transfer provision during the course.
- No affiliating University by 2035, all colleges will be autonomous, multidiscipline mode, and award certificates; Independent Board of Governance for each institution.
- At least one model multidisciplinary Education and Research University (MERU) in or near every district with minimum 3,000 students.
- Permanent teachers for all disciplines as per eligibility criteria of the Ministry of Education.
- Focus of NEP-2020 for Higher Education: 50% Gross Enrollment Ratio by 2035
- Multidisciplinary Education Flexibility (Multiple entry/exit; Diploma/degree)
- M.Phil. – discontinued, students can carry out research leading to Ph.D. after 4 years of graduate course with one year project work.
- Research intensive/Teaching intensive/Multidisciplinary Education and Research
- No rigid separation between Science & Arts; vocational and Academic streams
- Use of Technology in Teaching/learning/Assessment + Virtual labs in all institutions
- Phasing out Affiliating system in universities in 15 years i.e. by 2035
- Single regulator for Higher Education (except Legal and Medical education)
- National Professional Standard for Teachers (NPST)
- National Research Foundation (NRF) for all HEIs
- National Educational Technology Forum (NETF)
- Special Education zone for disadvantaged regions

- National Institute for Pali, Persian and Prakrit/Sanskrit
- Public investment to reach 6% of GDP; MHRD to be renamed as M/O Education
- Common norms for Public and Private HEIs(Private Philanthropic partnership)

**Requirement for Implementation of NEP 2020 in Odisha state:**

- State Universities will now offer 2 years/1 year PG course only or will impart UG + PG course for 6 year (4+1+1) or 5 year (3+1+1) year duration?
- Stand-alone +2 colleges will be merged with High school or will impart 4 years Secondary education (as there will be one board examination for 4-year course).
- Present Govt. and Aided UG/Composite colleges without multidisciplinary course will be closed or will be under a cluster colleges mode in universities is still unclear.
- Infrastructure for minimum 3,000 students and multi-discipline teaching in one HEI in a District.

**Use of Technology** has been given top most priority for Education Planning; Teaching, Learning & Assessment; Administration and Management; Regulation - Self Disclosure & Minimum Human Interface; Increasing Access for Disadvantaged Groups; Divyang Friendly Education Software; e-Content in Regional Languages; Virtual Labs and Digitally Equipping Schools, Teachers and Students

In addition, focus is given on Literature and Scientific Vocabulary of Indian Languages; appointment of Language Faculty; Research on Languages; Strengthening National Institutes for promotion of Classical Languages & Literature; Indian Institute of Translation and Interpretation (IITI and Cultural Awareness of our Indian Knowledge Systems.



04.12.2022: Talk on  
“Observing Environmental Change from Space”



**Prof. (Dr) Sandeep Narayan Kundu**  
Department of Geology,  
Ravenshaw University

**Abstract**

Space technology has immensely helped in observing and quantifying environmental change at scales which were not possible earlier. In today’s talk, the speaker shall walk you through the space related technologies that have aided observation of environmental change with potential insights on cause and effect. This shall be followed by a case study of environmental change in the tropic which involves palm plantation monoculture and environmental change.







## WEBINAR ON BIOFUELS

# Bioenergy Centre need of the hour for Odisha: OES

POST NEWS NETWORK

**Bhubaneswar, Jan 9:** The Orissa Environmental Society (OES) Sunday organized a webinar on 'Biofuels as alternative sources of energy' here. The webinar saw experts expressing their views emphasising on establishment of a bioenergy centre and popularising 'energy crops' in Odisha.

Experts were of the idea that biofuels, derived from biomass such as plants, algae, agriculture residue and animal wastes, are considered superior alternatives to fossil fuels as they are carbon-neutral, nontoxic, biodegradable and cleanerburning green substitutes. The need of the hour is to work, both at the levels of government as well as communities, for further improvement and popularisation of biofuels like biodiesel and ethanol that have gained world-wide acceptance, the suggested.

Subsequent to industrialisation till today, fossil fuels such as coal, petroleum, and natural gas, have been the major sources of energy that meet the ever escalating global demands of energy by various sectors. They are playing a vital role in empowering the economies of nations for over last 150 years, and providing about 80 per cent of the world's energy need currently.

However, in the scenario of enhanced emission of greenhouse gases from fossil fuels, which has culminated in serious environmental challenges like global warming and climate change, emphasis is now on the use of alternative, renewable sources of energy. These include solar energy, wind energy, biofuels, nuclear and geothermal energy which are naturally replenishing and virtually inexhaustible. Of course, hydropower and wood were the most used renewable energy resources until 1990s.

Sanjukta Subudhi, Senior Fellow



**Cultivation of biofuel crops such as sugarcane, wheat, corn, edible oilseeds, and technological upgradation need to be patronised by the government**

**SANJUKTA SUBUDHI | SENIOR FELLOW AND AREA CONVENER, MICROBIAL BIOFUELS AND BIOCHEMICALS GROUP, TERI, NEW DELHI**

and Area Convener, Microbial Biofuels and Biochemicals Group, TERI, New Delhi graced the webinar as the chief speaker and emphasised on the increased production of biofuels in order to reduce the pressure on fossil fuels, especially crude oil, and in agreement with the resolutions adopted in the recently held Glasgow Climate Conference. "Cultivation of biofuel crops such as sugarcane, wheat, corn, edible oilseeds, and technological upgradation need to be patronised by the government," she said.

On the occasion, OES President Sundara Narayan Patro underlined the importance of carrying out of training programmes for farmers to undertake cultivation of biofuel crops, and creating marketing facilities in this regard.

OES secretary Jaya Krushna Panigrahi opined that large scale dissemination of the research outcomes in the field of biofuels need to reach the user groups for wider adoption.

## 06.02.2022: Webinar on 'Environment & Tribes'



Speaker: **Prof. Jagannath Dash**,  
Former Head, Dept. of Anthropology,  
Utkal University, Bhubaneswar

### OES talk

# 'Rope in tribals for environment action'

PHS ■ BHUBANESWAR

Experts participating in a webinar on 'Environment and Tribes', organised under the auspices of the Orissa Environmental Society (OES) opined that the present world needs to learn lessons from the lifestyles of the indigenous people to bring lasting solutions to our environmental problems.

While the OES president Dr Sundara Narayana Patro presided over the programme, Prof Jagannath Dash, former Head, Department of Anthropology, Utkal University graced the webinar as the chief speaker. Prof



Dash narrated his long interactions with the tribal communities taking Similipal Biosphere Reserve as a case study. He explained

that these people being the primary dependants are inseparable from the forests and their knowledge on ecosystem functioning

is boundless. Tribes such as Hill Khadias, Ujias and Birhors consider Similipal as their primordial home with emotional bondage.

take utmost care of the resources within their territories and function as the real conservationists, he told. Dr Patro underlined that the ethnic people are the sacred trustees of natural heritage and with their active cooperation conservation measures can be made thriving.

Secretary Dr Jaya Krishna Panigrahi opened that modernity and consumerism have greatly influenced our environment detrimentally. "We need to emulate the tribes in our environmental protection initiatives," he told. Dr Lala AK. Singh also spoke about his experience in Similipal.





# ଓଇଏସର ପ୍ରକୃତି-ଗ୍ରାମ ପରିବର୍ତ୍ତନ 'ପ୍ରକୃତି-ଗ୍ରାମ ନମୁନାର ବ୍ୟାପକ ପ୍ରସାର ଲୋଡ଼ା'

ଭୁବନେଶ୍ୱର, ୧୩(ନି.ପ୍ର.): ତେଜାନାଳ ଜିଲାର ଭୁବନ ବ୍ଲକର କଣ୍ଠାମାଳିଆ ଗ୍ରାମରେ ସ୍ଥାପିତ ଶିଳତେନ୍ଦୁରତ୍ନ ପ୍ରକୃତି-ଗ୍ରାମର କାର୍ଯ୍ୟକାରୀତା ଉପରେ ଅନୁସନ୍ଧାନ କରିବା ପାଇଁ ଓଡ଼ିଶା ପରିବେଶ ସମିତି ଅନୁକୂଳ୍ୟରେ ଏକ କ୍ଷେତ୍ର ପରିବର୍ତ୍ତନ କାର୍ଯ୍ୟକ୍ରମ ଆୟୋଜିତ ହୋଇଥିଲା । ଏହି ପ୍ରକୃତି-ଗ୍ରାମ ଜୈବିକ ଚାଷ ଦ୍ୱାରା ପରିଚାଳିତ, ଫଳ ଏବଂ ଫସଲ ଚାଷ, ଗାଈ ଏବଂ କୁକୁଡ଼ା ପାଳନ; ବିଭିନ୍ନ ବୃକ୍ଷ ପ୍ରଜାତି ଓ ଗଛା ପାଖରେ ବୈଭିନ୍ୟବର୍ଦ୍ଧକ ଉଦ୍ଭିଦ ଲଗାଇବା, ବସ୍ତା ଜଳ ଅମଳ ପାଇଁ ପଦକ୍ଷେପ, ବୈଭିନ୍ୟ ଶକ୍ତି ବାଡ଼, ବନ୍ୟବସ୍ତୁର ସୁପରିଚାଳନା ଓ କମ୍ପୋଷ୍ଟ ମାଧ୍ୟମରେ ଖତ ପ୍ରସ୍ତୁତି ଏବଂ ଏକକ ବ୍ୟବହାର ପ୍ରାଣିକକୁ ପରିତ୍ୟାଗ କରିବା ଉପରେ ଗୁରୁତ୍ୱ ପ୍ରଦାନ କରୁଛି । ଏହି ପରିବର୍ତ୍ତନ ଅବସରରେ ସଭାପତି ଡ. ସୁନ୍ଦର ନାରାୟଣ ପାତ୍ରଙ୍କ ଅଧ୍ୟକ୍ଷତାରେ ଏକ ବୈଠକ ଆୟୋଜିତ ହୋଇଥିଲା । ପ୍ରାରମ୍ଭରେ ସମ୍ପାଦକ ଡ. ଜୟକୃଷ୍ଣ ପାଣିଗ୍ରାହୀ ପ୍ରକୃତି-ଗ୍ରାମର ବୈଶିଷ୍ଟ୍ୟ ବିଷୟରେ ବର୍ଣ୍ଣନା କରିଥିଲେ ଏବଂ ମତ ପ୍ରଦାନ

କରି କହିଥିଲେ ଯେ ଆମର ମାନସିକତା ଏବଂ ଜୀବନଶୈଳୀକୁ ପରିବର୍ତ୍ତନ କରି ମାନବ ମନ ଉପରେ ତଥା ପ୍ରକୃତି ମାତା ଉପରେ ହେଉଥିବା ବର୍ଦ୍ଧିତ ଚାପକୁ ହ୍ରାସ କରିବା ନିମନ୍ତେ ଆମର ପ୍ରୟାସ ଜାରି ରହିବ ଆବଶ୍ୟକ ।

ଇକୋଜିଲେଜର ପ୍ରତିଷ୍ଠାତା-ନିର୍ଦ୍ଦେଶକ ଙ୍କ ରାମକୃଷ୍ଣ ଦାଶ ଚାଙ୍କର ଯୋଜନାର ଯାତ୍ରା ଓ ନବ ନିର୍ବାଚିତ ସ୍ଥାନୀୟ ସରପଞ୍ଚ ମାଧବ ଚନ୍ଦ୍ର ଦାସ ପଞ୍ଚାୟତିରାଜ ଦିବସର ମହତ୍ତ୍ୱ ବିଷୟରେ ବର୍ଣ୍ଣନା କରିଥିଲେ ଓ ପ୍ରଫେସର ନିର୍ମଳ ଚନ୍ଦ୍ର ଦାଶ କରିଥିଲେ ଯେ ସ୍ଥାନୀୟ ଜନସଂଖ୍ୟାର ଅର୍ଥେକ ଆଦିବାସୀ ହୋଇଥିବାରୁ ସେମାନେ ସଂରକ୍ଷଣ ପ୍ରୟାସର ଅଂଶଦାର ହେବା ଆବଶ୍ୟକ । ଅନ୍ୟମାନଙ୍କ ମଧ୍ୟରେ ଡ. ପ୍ରଦୀପ କୁମାର ରଥ, ଡ. ବି ସତ୍ୟନାରାୟଣ, ପ୍ରଫେସର ରାମଚନ୍ଦ୍ର ମିଶ୍ର, ପ୍ରଫେସର ବି ସାତରାମ ପାତ୍ର, ଙ୍କ ବିନଳ କୃଷ୍ଣ ମିଶ୍ର, ରଘୁନାଥ ପୂଷ୍ଟି, ଏକାଦଶୀ ନନ୍ଦା, କବି ସପ୍ତା ଦେହେରା ଏବଂ ସୁଜାତା ମିଶ୍ର ପ୍ରମୁଖ ନିଜର ମତ ଉପସ୍ଥାପନ କରିଥିଲେ ।

# ଓଇଏସର ପ୍ରକୃତି-ଗ୍ରାମ ପରିବର୍ତ୍ତନ 'ପ୍ରକୃତି-ଗ୍ରାମ ନମୁନାର ବ୍ୟାପକ ପ୍ରସାର ଲୋଡ଼ା'

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କରି କହିଥିଲେ ଯେ ଆମର ମାନସିକତା ଏବଂ ଜୀବନଶୈଳୀକୁ ପରିବର୍ତ୍ତନ କରି ମାନବ ମନ ଉପରେ ତଥା ପ୍ରକୃତି ମାତା ଉପରେ ହେଉଥିବା ବର୍ଦ୍ଧିତ ଚାପକୁ ହ୍ରାସ କରିବା ନିମନ୍ତେ ଆମର ପ୍ରୟାସ ଜାରି ରହିବ ଆବଶ୍ୟକ ।

ଇକୋଜିଲେଜର ପ୍ରତିଷ୍ଠାତା-ନିର୍ଦ୍ଦେଶକ ଙ୍କ ରାମକୃଷ୍ଣ ଦାଶ ଚାଙ୍କର ଯୋଜନାର ଯାତ୍ରା ଓ ନବ ନିର୍ବାଚିତ ସ୍ଥାନୀୟ ସରପଞ୍ଚ ମାଧବ ଚନ୍ଦ୍ର ଦାସ ପଞ୍ଚାୟତିରାଜ ଦିବସର ମହତ୍ତ୍ୱ ବିଷୟରେ ବର୍ଣ୍ଣନା କରିଥିଲେ ଓ ପ୍ରଫେସର ନିର୍ମଳ ଚନ୍ଦ୍ର ଦାଶ କରିଥିଲେ ଯେ ସ୍ଥାନୀୟ ଜନସଂଖ୍ୟାର ଅର୍ଥେକ ଆଦିବାସୀ ହୋଇଥିବାରୁ ସେମାନେ ସଂରକ୍ଷଣ ପ୍ରୟାସର ଅଂଶଦାର ହେବା ଆବଶ୍ୟକ । ଅନ୍ୟମାନଙ୍କ ମଧ୍ୟରେ ଡ. ପ୍ରଦୀପ କୁମାର ରଥ, ଡ. ବି ସତ୍ୟନାରାୟଣ, ପ୍ରଫେସର ରାମଚନ୍ଦ୍ର ମିଶ୍ର, ପ୍ରଫେସର ବି ସାତରାମ ପାତ୍ର, ଙ୍କ ବିନଳ କୃଷ୍ଣ ମିଶ୍ର, ରଘୁନାଥ ପୂଷ୍ଟି, ଏକାଦଶୀ ନନ୍ଦା, କବି ସପ୍ତା ଦେହେରା ଏବଂ ସୁଜାତା ମିଶ୍ର ପ୍ରମୁଖ ନିଜର ମତ ଉପସ୍ଥାପନ କରିଥିଲେ ।

# OES: Eco village model needs wider replication

POST NEWS NETWORK

**Bhubaneswar, March 6:** The Orissa Environmental Society (OES) Sunday organised an exposure visit programme at the 'Waldenwoods Eco Village' established in Kantamalia village of Bhuban Block in Dhenkanal district, to take stock of the functioning of the model.

The eco village is still in its formative stage, and has been modeled to implement sustainability in people's lives through shared ecological, socio-economic and cultural-spiritual values.

At present, the cities and megacities of the world are experiencing enormous pollution from diverse sources. People are suffocating and suffering from various ailments while inhabiting in such places. The environment in urban areas is deteriorating progressively compelling people to leave the polluted and congested cities to rather secured, tranquil places where life can be enjoyed with the tranquil touch of nature. Therefore, the concept of eco village has attracted the attention of many across the globe.

The OES observed that for attaining self-sufficiency and implementing the ecological goals of sustainability, the eco village has undertaken cultivation of vegetables, fruits and crops by organic farming; rearing of cows and poultry; plantation of various plant species and ornamental plants along roadsides; rain-water harvesting measures; solar-energy fencing; waste-treatment facilities by composting; and abandoning single-use plastics. Attempts have been made to en-



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courage the inhabitants to adopt the traditional forms of community living in the built up cottages within its premises. It has also provisions of accommodating visitors from outside who intend to enjoy life for a while in such a magnificent, natural setting. Also, plantation of rare and endangered medicinal plants was undertaken after observing all the aspects of the eco-village.

A meeting was organised at the end of the visit, which was presided over by the OES President Sundara Narayan Patro. In the beginning, OES secretary Jaya Krishna Panigrahi narrated the goals of the eco village and opined that our focus needs to be on lessening the mounting stress on human mind as well as on nature by changing

our mindset and lifestyle.

The Founder-Director of the eco village, Ramkrishna Dash narrated his journey and the motto of providing a sustainable, healthy living place as well as diminishing the detrimental impacts of pollution and unchecked human interference on nature.

The newly elected sarpanch Madhab Chandra Das, while explaining the significance of Panchayati Raj Divas, expressed his desire to work for the protection of the environment in his locality. Former professor of FM University Nirmal Chandra Dash opined that as half of the local population constitutes tribal people, they need to be partners of conservation efforts. He was also presented the patron certificate of the society.





# ଓଇଏସ୍‌ର ‘ହାଇଡ୍ରୋଜେନ-ଶକ୍ତି-ପରିବେଶ ସଙ୍କଟର ଶ୍ରେଷ୍ଠ ସମାଧାନ’ ଡ୍ରେବିନାର

## ‘ଶକ୍ତିର ଆଗାମୀ ଉତ୍ସ ସବୁଜ ଉଦ୍‌ଜାନ’

ଭୁବନେଶ୍ୱର, ୨୫ (ବୁଧବେଳା): ଓଡ଼ିଶା ପରିବେଶ ସମିତି ଆନୁକୂଲ୍ୟରେ ‘ହାଇଡ୍ରୋଜେନ-ଶକ୍ତି ପରିବେଶ ସଙ୍କଟର ଶ୍ରେଷ୍ଠ ସମାଧାନ’ ବିଷୟବସ୍ତୁ ଉପରେ ଏକ ଡ୍ରେବିନାର ଅନୁଷ୍ଠିତ ହୋଇଯାଇଛି । ଶକ୍ତି ସଂଗ୍ରହର ଆଗାମୀ ଉତ୍ସ ଉଦ୍‌ଯାନ ବୋଲି ଏଥିରେ ଅଂଶଗ୍ରହଣ କରିଥିବା ବିଶେଷଜ୍ଞମାନେ ମତ ପୋଷଣ କରିଛନ୍ତି । ଏହି କାର୍ଯ୍ୟକ୍ରମରେ ମୁଖ୍ୟ ଅତିଥି ଭାବେ ଦିଲ୍ଲୀ ଆଇଆଇଟିର ଶକ୍ତି ଅଧ୍ୟୟନ କେନ୍ଦ୍ରର ପୂର୍ବତନ ପ୍ରଫେସର ଡ. ଲଳିତ ମୋହନ ଦାସ ଯୋଗଦେଇ ବିଶ୍ୱରେ ଶକ୍ତି ଦୃଶ୍ୟପଟ ଏବଂ ଏହାର ଉତ୍ପାଦନ ଉତ୍ସ ଉପରେ ଆଲୋଚନା କରିଥିଲେ ।

ପ୍ରଫେସର କୃଷ୍ଣଚନ୍ଦ୍ର ସାହୁ, ଡ. ଡି ପି ମିଶ୍ର, ଡ. ବିଶ୍ୱେଶ୍ୱର ଦାସ ଓ ଡ. ବିମଳ କୃଷ୍ଣ ମିଶ୍ର ପ୍ରମୁଖ ଅତିଥି ଭାବେ ଯୋଗଦେଇ କହିଥିଲେ, ବିଶ୍ୱତାପନ ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ସମସ୍ୟାର କାରଣ ପାଲଟିଛି । ଶକ୍ତି ଗବେଷଣାକାରୀମାନେ ସବୁଜଗୃହ ବାଷ୍ପର ନିର୍ଗମନକୁ ନିୟନ୍ତ୍ରଣ କରିବା ନିମନ୍ତେ ବିକଳ, ସ୍ୱଳ୍ପ ଶକ୍ତି ଉତ୍ସର ସନ୍ଧାନରେ ଅଛନ୍ତି । ଯାହା ବିପର୍ଯ୍ୟୟ ସୃଷ୍ଟିକାରୀ ବିଶ୍ୱ ତାପମାତ୍ରାକୁ ବୃଦ୍ଧିକୁ ରୋକିବାରେ ସମର୍ଥ ହେବ । ଏଥିରେ ଉପସଭାପତି ଡ. ଲୀଳା ଏ.କେ ସିଂହ ଅତିଥି ପରିଚୟ ପ୍ରଦାନ କରିଥିଲେ । ପୂର୍ବତନ ପିସିସିଏଫ ଡ. ବିଜୟ କେତନ ପଟ୍ଟନାୟକ ଧନ୍ୟବାଦ ଦେଇଥିଲେ । ଏହି କାର୍ଯ୍ୟକ୍ରମରେ ବହୁ ପରିବେଶବିତ୍, ଶିକ୍ଷାବିତ୍ ଓ ପ୍ରଯୁକ୍ତି ବିଜ୍ଞାନୀ ଯୋଗ ଦେଇଥିଲେ ।

26.10.2022: Foundation Day Function

ଓଡ଼ିଶା ସରକାର ଧର୍ଯ୍ୟ ପ୍ରତିଷ୍ଠା ଦିବସ

ଜଳବାୟୁ ପରିବର୍ତ୍ତନ ସବୁଠୁ ବଡ଼ ଆହ୍ୱାନ



ଭୁବନେଶ୍ୱର, ୨୬.୧୦ (ବୁଧବେ) : ବିଜ୍ଞାନ-କଳା-ସମ୍ମାନ ପରେ ସମଗ୍ର ଖଣ୍ଡରେ ଜଳବାୟୁ ପରିବର୍ତ୍ତନକୁ ନେଇ ଏବେ ମହାନ ଆନ୍ଦୋଳନମାନ ଆରମ୍ଭ ହେଉଛି । ବିଶ୍ୱ ନେତୃତ୍ୱ ଉପସ୍ଥଳ କର୍ମାଧିକାରୀ ଗୁଡ଼ିକ ମଧ୍ୟରେ ଏହାର ପ୍ରତିହତ ନିମନ୍ତେ ଅନ୍ତରାଷ୍ଟ୍ରୀୟ ଯତ୍ନ ସହଜକୁ ବ୍ୟବସ୍ଥା କରିବାକୁ ହ୍ରାସ କରିବା ପ୍ରୟାସ ଆରମ୍ଭ କରିଛନ୍ତି । ତେବେ ବିଶ୍ୱ ଧରଣୀକୁ ଦୃଷ୍ଟି ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନର ଉଚ୍ଚତମ ସ୍ତରରେ ବିଶ୍ୱରେ ପ୍ରତିବନ୍ଧନ ଆରମ୍ଭ ହେଉଛି ।

ପରିବେଶ ସମିତିର ଧର୍ଯ୍ୟ ପ୍ରତିଷ୍ଠା ଦିବସ ଏବଂ ପୁରୁଷାର ପ୍ରଦାନ ଉତ୍ସବ ଅବସରରେ ପୁଣ୍ୟଅଟିଥି ଭବେ ଭାରତ ସରକାରଙ୍କ ପୂର୍ବଦତ୍ତ ଜଳବାୟୁ ମହାମିଶନର ବିଶ୍ୱର ବନ୍ଧ ଯେତେବେଳେ ଏହା କରିଛନ୍ତି ।

ଏହି ଅବସରରେ ଶ୍ରୀ ଦାସ ପୂର୍ବଦତ୍ତ ବିଧାନସଭା ବଜ୍ରପତି ତଥା ଡେପ୍ୟୁଟି ପ୍ରତିଷ୍ଠାତା ସଭାପତି ପ୍ରସନ୍ନ କୁମାର ଦାଶଙ୍କ ନେତୃତ୍ୱ ଏକଦଶ ସ୍ୱାଗତା ବକ୍ତୃତା ପ୍ରଦାନ କରିଥିଲେ । କର୍ମାଧିକାରୀ ପୁଣ୍ୟଅଟିଥି ଶ୍ରୀ ଦାସ ପୂର୍ବଦତ୍ତ ପ୍ରଧାନ ମୁଖ୍ୟ ଭବ ସଂରକ୍ଷକ ଡ. ବିଜୟ

କେତନ ପଟ୍ଟନାୟକଙ୍କୁ ଜଳବାୟୁ, ବନ୍ୟଜୀବ ଏବଂ ପରିବେଶ ସୁରକ୍ଷା କ୍ଷେତ୍ରରେ ତାଙ୍କର ଅବଦାନ ନିମନ୍ତେ 'ଜୀବନବ୍ୟାପୀ କୃତି ପୁରସ୍କାର' ପ୍ରଦାନ କରିଥିଲେ । ସଭାପତି ଡ. ସୁରେଶ ନାରାୟଣ ପାଣ୍ଡୁ ଓ ସମ୍ପାଦକ ଡ. ଜୟକୃଷ୍ଣ ପାଣିଗ୍ରାହୀ ଡେପ୍ୟୁଟି ପ୍ରତିଷ୍ଠାତା ସୁରକ୍ଷା ଓ ସେତେବେଳର ବର୍ତ୍ତମାନ ସଭାପତି ତଥା ପ୍ରକାଶ କରିଥିଲେ । ଅନ୍ୟମାନଙ୍କ ମଧ୍ୟରେ ଉପ-ସଭାପତି ଡ. ରାଜା ଏ.କେ ସିଂହ, ସୁସ୍ଥ ସମ୍ପାଦକ ଡ. ମନୋରଞ୍ଜନ ମିଶ୍ରଙ୍କ ସହ ବହୁ ପରିବେଶବିତ, ଶିକ୍ଷକ ଓ ଏବଂ କୃଷିଜୀବୀ ଯେଉଁମାନେ ଉପସ୍ଥିତ ଥିଲେ ।

‘ପ୍ରାକୃତିକ ଜଙ୍ଗଲ, ଆର୍ଦ୍ରଭୂମିର ସଂରକ୍ଷଣ ପାଇଁ ପ୍ରତିବନ୍ଧ ହେବା ଉଚିତ’

ଭୁବନେଶ୍ୱର, ୨୬.୧୦ (ବୁଧବେ)

ଓଡ଼ିଶା ପରିବେଶ ସମିତିର ଧର୍ଯ୍ୟ ପ୍ରତିଷ୍ଠା ଦିବସ

ବିଜ୍ଞାନ-କଳା-ସମ୍ମାନ ପରେ ସମଗ୍ର ଖଣ୍ଡରେ ଜଳବାୟୁ ପରିବର୍ତ୍ତନକୁ ନେଇ ଏବେ ମହାନ ଆନ୍ଦୋଳନମାନ ଆରମ୍ଭ ହେଉଛି । ବିଶ୍ୱ ନେତୃତ୍ୱ ଉପସ୍ଥଳ କର୍ମାଧିକାରୀ ଗୁଡ଼ିକ ମଧ୍ୟରେ ଏହାର ପ୍ରତିହତ ନିମନ୍ତେ ଅନ୍ତରାଷ୍ଟ୍ରୀୟ ଯତ୍ନ ସହଜକୁ ବ୍ୟବସ୍ଥା କରିବାକୁ ହ୍ରାସ କରିବା ପ୍ରୟାସ ଆରମ୍ଭ କରିଛନ୍ତି । ତେବେ ବିଶ୍ୱ ଧରଣୀକୁ ଦୃଷ୍ଟି ଓ ଜଳବାୟୁ ପରିବର୍ତ୍ତନର ଉଚ୍ଚତମ ସ୍ତରରେ ବିଶ୍ୱରେ ପ୍ରତିବନ୍ଧନ ଆରମ୍ଭ ହେଉଛି ।



ଅଧିକାରୀଙ୍କୁ ଜଳବାୟୁ ମହାମିଶନର ବିଶ୍ୱର ବନ୍ଧ ଯେତେବେଳେ ଏହା କରିଛନ୍ତି । ଏହି ଅବସରରେ ଜଳବାୟୁ, ବନ୍ୟଜୀବ ଏବଂ ପରିବେଶ ସୁରକ୍ଷା କ୍ଷେତ୍ରରେ ତାଙ୍କର ଅବଦାନ ନିମନ୍ତେ 'ଜୀବନବ୍ୟାପୀ କୃତି ପୁରସ୍କାର' ପ୍ରଦାନ କରିଥିଲେ । ସଭାପତି ଡ. ସୁରେଶ ନାରାୟଣ ପାଣ୍ଡୁ ଓ ସମ୍ପାଦକ ଡ. ଜୟକୃଷ୍ଣ ପାଣିଗ୍ରାହୀ ଡେପ୍ୟୁଟି ପ୍ରତିଷ୍ଠାତା ସୁରକ୍ଷା ଓ ସେତେବେଳର ବର୍ତ୍ତମାନ ସଭାପତି ତଥା ପ୍ରକାଶ କରିଥିଲେ । ଅନ୍ୟମାନଙ୍କ ମଧ୍ୟରେ ଉପ-ସଭାପତି ଡ. ରାଜା ଏ.କେ ସିଂହ, ସୁସ୍ଥ ସମ୍ପାଦକ ଡ. ମନୋରଞ୍ଜନ ମିଶ୍ରଙ୍କ ସହ ବହୁ ପରିବେଶବିତ, ଶିକ୍ଷକ ଓ ଏବଂ କୃଷିଜୀବୀ ଯେଉଁମାନେ ଉପସ୍ଥିତ ଥିଲେ ।

ପରିବେଶ ସମିତିର ଧର୍ଯ୍ୟ ପ୍ରତିଷ୍ଠା ଦିବସ ଏବଂ ପୁରୁଷାର ପ୍ରଦାନ ଉତ୍ସବ ଅବସରରେ ପୁଣ୍ୟଅଟିଥି ଭବେ ଭାରତ ସରକାରଙ୍କ ପୂର୍ବଦତ୍ତ ଜଳବାୟୁ ମହାମିଶନର ବିଶ୍ୱର ବନ୍ଧ ଯେତେବେଳେ ଏହା କରିଛନ୍ତି । ଏହି ଅବସରରେ ଜଳବାୟୁ, ବନ୍ୟଜୀବ ଏବଂ ପରିବେଶ ସୁରକ୍ଷା କ୍ଷେତ୍ରରେ ତାଙ୍କର ଅବଦାନ ନିମନ୍ତେ 'ଜୀବନବ୍ୟାପୀ କୃତି ପୁରସ୍କାର' ପ୍ରଦାନ କରିଥିଲେ । ସଭାପତି ଡ. ସୁରେଶ ନାରାୟଣ ପାଣ୍ଡୁ ଓ ସମ୍ପାଦକ ଡ. ଜୟକୃଷ୍ଣ ପାଣିଗ୍ରାହୀ ଡେପ୍ୟୁଟି ପ୍ରତିଷ୍ଠାତା ସୁରକ୍ଷା ଓ ସେତେବେଳର ବର୍ତ୍ତମାନ ସଭାପତି ତଥା ପ୍ରକାଶ କରିଥିଲେ । ଅନ୍ୟମାନଙ୍କ ମଧ୍ୟରେ ଉପ-ସଭାପତି ଡ. ରାଜା ଏ.କେ ସିଂହ, ସୁସ୍ଥ ସମ୍ପାଦକ ଡ. ମନୋରଞ୍ଜନ ମିଶ୍ରଙ୍କ ସହ ବହୁ ପରିବେଶବିତ, ଶିକ୍ଷକ ଓ ଏବଂ କୃଷିଜୀବୀ ଯେଉଁମାନେ ଉପସ୍ଥିତ ଥିଲେ ।

**OES foundation day, award fest**

# 'Climate change, the greatest challenge of our time'

**PHS ■ BHUBANESWAR**  
**C**onsequent to the warnings issued by scientists, serious discussions are underway across the globe concerning the climate change. World leaders have begun efforts to reduce the emissions of greenhouse gases such as carbon dioxide to meet this challenge through adoption of various appropriate measures. However, there is urgency for the people to be more aware about the causes and prevention of global warming and climate change. They will then be empowered to face the natural disasters more effectively and help in identifying pertinent

solutions.  
 Former Director General of Forests, Government of India, Siddhanta Das expressed such views as chief guest on the 41st foundation day and award ceremony of the Orissa Environmental Society (OES) here on Wednesday. He delivered the 11th Prasanna Kumar Dash Memorial Lecture, instituted after the name of the former Assembly Speaker and OES founder-president.  
 Citing the Prime Minister's announcement at the Paris Climate Conference, Das emphasised that we need to sequester more than two billion tonnes of carbon by 2030 through conserving forests and soils and



undertaking massive plantations. It is highly desirable to express our commitment for the protection and conservation of natural forests and wetlands.  
 Former PCCF (Wildlife) and Chief Wildlife Warden Dr Bijay Ketan Pattnaik was conferred with the Lifetime Achievement Award for his outstanding contribution to

the field of forest, wildlife and environmental protection. Prof Arun Kumar Sahu, eminent educationist and science writer, was presented the Dr BC Panda Award for Environment & Science Communication. Resident, Prof B Sitaram Patro, Ir Binod Chandra Padhi, Prof Nimesh Charan Mishra, Ir Harishchandra Behera and

Biranchi Mishra were felicitated as senior life members of OES.  
 OES president Dr Sundara Narayana Patro said the OES would perform a more proactive role and undertake further activities in Odisha to tackle the serious environmental problems that are visible in the current global landscape.

OES secretary Dr Jayakrushna Pantgrahi revealed how despite the many obstacles in its journey, the OES has been spreading the message of environmental protection and awareness through expert opinions on various important issues. He opined that there is a need now for a significant change in our mindset, lifestyle and activities.  
 OES vice-president Dr Lala AK Singh introduced the guests and joint secretary Ir Manoranjan Mishra presented information about the 20,000 tree plantation programme being implemented by the OES with support from the State Bank of India.

Dr. S. N. Patro, President, OES unfurled the national flag on the occasion of the Republic Day (left), and hoisted the national flag on the Independence Day (right)



## **2.1. WORLD ENVIRONMENT DAY SPECIAL SUBMISSION-2022**

### **An Introspection of 50 Yrs. of Celebration**

#### **Submission by:**

K. C. Sahu Prof. Retd., IIT Bombay, sahu\_kc@yahoo.com

The UN General Assembly, in its Stockholm Conference on "Human Environment" held in 1972, proposed 5th. June, to celebrate as World Environment Day (WED). The purpose of celebration was to arouse awareness among various levels, the alarming rate of environmental stress that earth is facing due to population explosion, resources depletion and industrialization. Each year a Theme is selected and the celebration flagged off in the capital city of a country and carried on world over by way of seminars, meetings and projects. During the last 5 decades of celebration, since it started in 1972, there has been a series of Themes of global importance, most concerned with Earth, such as:

1974: Only One Earth (The Slogan of 1972 Stockholm Conference).

1994: One Earth, One Family. (Vasudeba Kutumbakam).

1999: Our Earth, Our Future, Just Save It.

2001: Connect with the World Wide Web of life.

2002: Give Earth a Chance.

2003: Water - 2 billion people are dying for it.

2004: Wanted Seas and Oceans - Dead or Alive.

2005: Green Cities - Plan for the Planet.

2008: Kick the Habit towards a low carbon economy.

2009: Your Planet Needs You - Unite to Combat Global Warming.

2010: Many Species, One Planet, One Future/ Biodiversity.

2022: Only One Earth.

The first and the latest WED Themes show, 50 years since we started, the truth still holds that this Planet is our only home but poorly husbanded. Worse of all the driver on the steering wheel of our Space van is technoholic.

No doubt, the thematic celebrations have generated a tremendous volume of awareness among people at all levels, there has been little relief of environmental stress in the domain of any of the themes mentioned above. For examples, Berlin wall has been demolished, but States and Nations have been further fragmented and riddled with religious, social, economic conflicts and terrorism. Even the Family is atomised. “The earth has been flattened”, levelled through Science and Technology, but the gap between rich and poor has widened. Forest cover has shrunk further, developmental projects like establishment of industries, power plants, SEZs and building of dams have encroached human habitats, violated human rights, produced millions of ecological refugees and urban migration has crippled city infrastructures in most developing countries – India is a living example. Carbon emission continues to increase, “Climatic change” remains a mere debate and lost in commercialized Carbon Trading in World Carbon Bazaar, water pollution in land and ocean (oil spill) have increased and water conflicts (water share/ water wars) have spread over mountain glaciers, rivers, lakes, dams and trickled down to municipal districts and public taps. Of late, Globalization of “Man, Microbe and Materials” has brought fatal Corona pandemic.

Increased environmental stress and global environmental deterioration, in spite of increased awareness is considered to be due to:

- (1) Our limit in levels of environmental awakening and
- (2) Our anthropocentric approach to environment which presupposes “Nature for service of man” and undermines Nature and natural elements.

Even if globally aware, our perception of Nature is determined by our experience to immediate surroundings. Environmental factors such as hot, cold, humid, smelly, acidic, dusty, noisy, bright, crowded, suffocating, even subjective feelings like violent, unethical (corruption) have variation in geographic space and time and when sensed, their perception depends on our level of awakening ( like Sensitivity, when instruments are used). Therefore, keeping our living room or factory floor clean, our city green, demand for “Sons of the Soil”, “Amar Sonar Bangla”, “My country, My people, My nation”, “Asia for Asiatic” - that was Hiro Hitto’s slogan in 2nd . World war, “Keep Australia White”, “Deutschland, Deutschland, Uber Ales” - that was Hitler’s sermon; are but various scales and levels of consciousness.

Environment has no such “narrow domestic walls” nor does the dispersion of pollutants obey boundaries of countries. While we may be disturbed if a neighbour hammers a nail in his room at midnight for hanging a mosquito curtain, most of us do not hesitate to hold a midnight disco in our apartment or favour for extension of loudspeaker use till midnight or beyond during various celebrations. In short, a good environmentalist is one who keeps his garden clean and green but throws the cuttings to neighbour’s garden across the fence. In a more civilized way, gathers the cuttings in a plastic bag for municipal van to dispose in a dumping ground where the environment is further worsened. Airconditioning increases the comfort of our living room by pumping the heat out but makes outside hotter. In the modern modes of environmental mitigations where economy rules over ecology, the “Marginals” are further marginalized, that is, “the rich gets richer and the poor gets poorer”, nay “the poors get children”.

Anthropocentric approach, that Nature and natural elements are meant only for humans, is the root cause of

environmental deterioration and failure of remediation. Where “rocks or rivers have no rights” the future children will have no opportunity to see the majestic mountain cliffs, cascading streams or a “silent spring”. As much as a forest is an important source for our timber and cellulose needs, it is the only home, shelter and livelihood of a larger number of living species including tribals. Similarly, a river collects water in highlands and nutrients from rock decomposition and flows down to distribute the life sustaining elements to all living things along its course. Even the deltaic and near-shore ocean lives are totally dependent on river discharges. Therefore, such ecological elements like hills, forest or river could not be cornered exclusively for human consumption, damaged or blocked in the name of progress, development or settlements and when indiscriminately done, Nature rules by checks and balance, resulting in failure of environmental mitigations. Anthropocentricity easily slips into egocentric approach where the modes of environmental mitigation or remediation is decided by education, training and attitude of the contemporary leaders/architects/experts in the helm of affairs. Thus, we see conflicts of Petrolites & Dieselites, Coalites & Nuclearites, conventional vs. nonconventional experts in sector of energy use, emphasis on urban or rural development, BT vs. Organic foods, industrial vs. agricultural development etc. The tragedy is, these Stevedores of environmental mitigators do not live to see the downstream impacts of their deeds but virtually “Mortgaged the Future”.

Intriguing observations of the present day scenarios on environmental celebration with ecology pushed into the frame work of economy are, when “environmental disruptors” like coal and petroleum companies, mining industries, power plant sectors “go green” by mass indoctrination through media advertisements, fiscal supports for cosmetic remediation. Similarly, chemical and pharmacy industries do not hesitate to

sponsor environmental events, automobile industries hold car and mobike rallies, produce “ecoSUV” and mineral water/soft drink manufacturers soak thirst in Greenathons. CSR (Corporate Social Responsibility) is anthropocentric and cannot restore ecological damages as much as “Daridra Narayana Bhojan cannot eradicate world hunger, it perpetuates it”.

Like celebration of many of our Indian festivals such as Ganapati-puja, Dewali, AkshayaTritia and Holi, which fail to revoke the essence and ethics of the festivals but lavishly commercialized, celebration of environmental events too, though increases public awareness, does not prevent ecological and environmental deterioration. It is therefore no surprise to find similarity of post-celebration scenarios like that of Ganapati immersion grounds with decapitated idols of deity and, scattered litters and piles of empty water bottles along allies and rallies of greenathons.

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## 2.2. List of P. K. Dash Memorial Lectures

Delivered on OES Foundation Day

- 2022: **Sri Sidhanta Das**, Former Director General of Forests, Government of India; Conservation and Climate Change
- 2021: **Dr. Veerendra Pratap Upadhyaya**, Former Adviser, MoEFCC, Govt. of India: 'Environment Odisha: The way forward'.
- 2020: **Dr. Anup Kumar Nayak**, Former Additional Director General (Wildlife) and Member Secretary, National Tiger Conservation Authority, Government of India: 'Tiger Conservation'
- 2019: **Prof. Pramod Chandra Mishra**, President, Bigyan Academy, Orissa: 'Fluorosis: Source, Excursion, Control and Management'
- 2018: **Dr. Debabrata Swain**, IFS, Principal Chief Conservator of Forests, Odisha: 'Conservation of Biodiversity Habitats in Odisha'
- 2017: **Sri Saroj Kumar Pattnaik**, Former Addl. PCCF (Wildlife) and Chief Wildlife Warden, Odisha: 'Wildlife Scenario in Odisha'
- 2016: **Er. Nanda Kumar Mohapatra**, Former Chief Engineer-Irrigation, Government of Odisha: 'Water Resources: Engine for Improvement of Quality of Life and Economic Development'
- 2015: **Sri Priyanath Padhi**, Former Principal Chief Conservator of Forests, Odisha: 'Conservation of environment and the poor- a social dimension'

2014: **Prof. (Dr) Omkar Nath Mohanty**, Director, Technology and Academic Initiative, RSB Metaltech, RSB Group: 'Utilisation of effluents from integrated steel plants- some examples'

2013: **Dr. Trilochan Mohapatra**, Director, Central Rice Research Institute, Cuttack: 'Environmentally sustainable food security'

2012: **Shri Bijay Kumar Patnaik**, Former Principal Chief Conservator of Forests and Chief Wildlife Warden, UP

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### **3. ODISHA BIGYAN 'O' PARIBESH CONGRESS (OBPC) - 2022**

The Odisha Bigyan Congress (OBC) had its genesis in the year 1997 to endow with an apt platform to the scientific community of the State for deliberating on the advances in science and technology in diverse frontiers. From 2016 a little amendment has been there in the title of the Congress to make it Odisha Bigyan 'O' Paribesh Congress (OBPC) for focusing attention on the environmental challenges confronting the mankind at the present juncture. The Congress brings out the voluminous proceedings in shape of a book. A large number of students and scholars use the platform provided by OBPC and the proceedings to communicate their research work and achievements. The Congress has been successfully organized in different academic institutions for the last twenty-two years, thanks to the dedicated teams.

#### **3.1. The 23<sup>rd</sup> OBPC, 26-27 November, 2022**

Focal theme: 'Science and Technology in Combating Climate Change'

Organizers: Orissa Environmental Society, Bhubaneswar, and Sambalpur University, Burla

#### **A Brief Report**

The 23<sup>rd</sup> Odisha Bigyan 'O' Paribesh Congress (OBPC) was organized under the joint auspices of the Orissa Environmental Society and the Sambalpur University in the Biju Patnaik auditorium of the university on 26-27 November, 2022. With the participation of about 500 scientists, academics, researchers and students of science and technology from the nook and cranny of the state and beyond, and the presence of a

galaxy of scientists of great repute as invited guests, the 23<sup>rd</sup> OBPC touched new heights of success. A national conference on the focal theme, 'Science and Technology in Combating Climate Change' was organized on this occasion.

The inaugural function of the Congress was held on 26<sup>th</sup> November at 10.30 am in which Dr. Mrutyunjay Mohapatra, DGM, IMD, Govt. of India was the Chief Guest and Dr. Basanta Kumar Das, Director, ICAR-CIFRI, Kolkata was the Guest of Honour. Five eminent academics/scientists were felicitated by the guests for their lifetime contributions to the field of scientific research, namely Prof. Pravat Kumar Mohapatra (Life Sciences), Prof. Pramod Chandra Mishra (Environmental Sciences), Dr. Chitta Ranjan Mishra (Chemical Sciences), Prof. Sankar Prasad Pati (Physical Sciences) and Prof. Hrushikesh Sahoo (Earth Sciences). Dr. Mrutyunjay Mohapatra made the keynote speech on the focal theme of the Congress. The invited speakers of this two-day event were Dr. Bijay Kumar Sahu, Dr. Dushmanta Ranjan Pattanaik, Dr. Kinsuk Acharyya, Prof. Atanu Kumar Pati and **Prof. Arun Kumar Pujari, who spoke on various pertinent fields of current research.** A panel discussion was held on the topic 'Climate change - Adaptation and mitigation measures in diverse arenas', which was chaired by Prof. Surya Narayan Nayak and the panelists were Prof. Pravin Kumar Kar, Prof. Sadhu Charan Panda and Prof. Prakash Kumar Hota. The researchers made their oral presentations on the first day and the poster presentations on the second day of the Congress in three parallel technical sessions - biological, physical and technological. The valedictory function was graced by Prof. Arun Kumar Pujari, former Vice-Chancellor, SU, Burla as the Chief Guest and Prof. Banshidhar Majhi, Vice-Chancellor, VSSUT, Burla as the Guest of Honour.

Besides, Prof. Sundara Narayana Patro (President, OES), Dr. Jaya Krushna Panigrahi (Secretary, OES - Convener, OBPC),

Dr. Amaresh Mishra [Assoc. Prof. in Chemistry, SU - Convener (In-house)] and Dr. Smaranika Pattnaik (Asst. Prof. in Life Sciences, SU - Organizing Secretary) were also present in different sessions of the Congress. The details of the two-day programme are as presented below.

### Day 1 (November 26,2022 - Saturday)

08:30 am-10:00 am	Registration
10:00 am-11:30 am	<p>Inaugural Function</p> <p>Chief Guest: <b>Dr. Mrutyunjay Mohapatra</b>, DGM, IMD, Govt. of India</p> <p>Guest of Honour: <b>Dr. Basanta Kumar Das</b>, Director, ICAR-CIFRI, Kolkata</p> <p>President: <b>Prof. Sanjukta Das</b>, Vice-Chancellor (I/c), Sambalpur University</p> <p><b>Prof. Sundara Narayana Patro</b>, President, OES</p> <p><b>Dr. Jaya Krushna Panigrahi</b>, Secretary, OES - Convener</p> <p><b>Dr. Amaresh Mishra</b>, Reader in Chemistry, SU - Convener (In-house)</p> <p><b>Dr. Smaranika Pattnaik</b>, Asst. Prof. in Life Sci, SU - Organizing Secretary</p> <p>(Felicitation to distinguished academics/scientists – Prof. Pravat Kumar Mohapatra, Prof. Pramod Chandra Mishra, Dr. Chitta Ranjan Mishra, Prof. Sankar Prasad Pati and Prof. Hrushikesh Sahoo)</p>
11:30 am-11:40 pm	<i>Tea Break</i>
11:40 pm-12:30 pm	Keynote Address on ‘Science & Technology in Combating Climate Change’ by <b>Dr. Mrutyunjay Mohapatra</b> , DGM, India Met. Department, Govt. of India

12:30 pm-01:30 pm	<p>Invited Lecture - I: 'Role of Technology, Innovation and Intellectual Property in Academia-Industry Collaboration for Achieving SDGs' by <b>Dr. Bijay Kumar Sahu</b>, Sr. Regional Manager &amp; Head (IPSC &amp; TISC), Min. of Sc. &amp; Tech., Govt. of India</p> <p>Invited Lecture-II: 'Climate change and prediction of extreme weather events' by <b>Dr. Dushmanta Ranjan Pattanaik</b>, Scientist F, IMD, New Delhi</p>
01:15 pm-02:00 pm	<i>Lunch Break</i>
02:15 pm-04:00 pm	Technical Sessions - I, II, III
04:00 pm-04:15 pm	<i>Tea Break</i>
04:15 pm-05:30 pm	Technical Sessions - I, II, III (Continued in parallel)

### Day 2 (November 27, 2022 - Sunday)

10:00 am-11:30am	<p>Panel Discussion on 'Climate change - Adaptation and mitigation measures in diverse arenas'</p> <p><b>Chair: Prof. Surya Narayan Nayak</b>, HoD of Physics, Sambalpur University</p> <p><b>Panelists: Prof. Pravin Kumar Kar</b>, Dept. of Chemistry, VSSUT, Burla</p> <p><b>Prof. Sadhu Charan Panda</b>, HoD of Community Medicine, VIMSAR, Burla</p> <p><b>Prof. Prakash Kumar Hota</b>, Dept. of Electrical Engineering, VSSUT, Burla</p>
11:30 am-11:45am	Tea Break
11:45 am-12:30pm	Invited Lecture - III: 'Exploring extra-terrestrial life - Is it vital?' by <b>Dr. Kinsuk Acharyya</b> , Assoc. Prof., PRL, Ahmedabad

12:30 pm-01:10pm	Invited Lecture - IV: 'Sixth Extinction - A reality or a myth?' by <b>Prof. Atanu Kumar Pati</b> , former Vice-Chancellor, GM University
01:10 pm-02:00pm	Lunch
02:10 pm-03:00pm	Poster Session
03:00 pm-03:45pm	Invited Lecture - V (Artificial intelligence regulating human life): <b>Prof. Arun Kumar Pujari</b> , former Vice-Chancellor, Sambalpur University
03:45 pm-05:00 pm	<p><b>Valedictory Function</b></p> <p>Chief Guest: <b>Prof. Arun Kumar Pujari</b>, former Vice-Chancellor, SU, Burla</p> <p>Guest of Honour: <b>Prof. Banshidhar Majhi</b>, Vice-Chancellor, VSSUT, Burla</p> <p>President: <b>Prof. Sundara Narayana Patro</b>, President, OES</p> <p><b>Dr. Jaya Krushna Panigrahi</b>, Secretary, OES - Convener</p> <p><b>Dr. Amaresh Mishra</b>, Associate Prof. in Chemistry, SU - Convener (In-house)</p> <p><b>Dr. Smaranika Patnaik</b>, Asst. Prof. in Life Sciences, SU - Organizing Secretary</p>

### 3.2. FELICITATION TO DISTINGUISHED SCIENTISTS AT OBPC (2006-2022)

SI No	No. of OBC (Year)/ Venue	Distinguished Scientists Felicitated
18.	23 <sup>rd</sup> (2022) Sambalpur University	<p><b>Prof. Pravat Kumar Mohapatra</b> Former Professor, School of Life Sciences, Sambalpur University</p> <p><b>Prof. Pramod Chandra Mishra,</b> Former Professor, Dept. of Environmental Sciences, Sambalpur University</p> <p><b>Dr. Chitta Ranjan Mishra,</b> Former DGM, NALCO and Science Communicator</p> <p><b>Prof. Hrushikesh Sahoo</b> Former Professor of Geology, Utkal University</p> <p><b>Prof. Sankar Prasad Pati</b> Former Professor, School of Physics, Sambalpur University</p>
17	22 <sup>nd</sup> (2021) Ravenshaw University	<p><b>Prof. Krushna Chandra Sahu</b> Former Professor, IIT Bombay</p> <p><b>Prof. Ganapati Panda</b> Former Dy. Director, IIT BBSR</p> <p><b>Prof. Sanjay Kumar Nayak</b> Vice Chancellor, Ravenshaw University</p> <p><b>Padmashree Dr. Ajay Parida</b> Director, ILS Bhubaneswar</p> <p>Dr. Sanghamitra Pati Director, ICMR-RMRC, BBSR</p>
16	21 <sup>st</sup> (2019)	<b>Prof. Ashok Kumar Tripathy</b>

	SOADU, Bhubaneswar	Power Systems Engineer. <b>Prof. Niranjana Barik</b> Former Professor of Physics, Utkal University. <b>Prof. Santosh Kumar Kar</b> Professor, School of Biotechnology, KIIT University. <b>Prof. Amit Banerjee</b> Vice-Chancellor, Siksha 'O' Anusandhan University, Bhubaneswar
15	20 <sup>th</sup> (2018) NISER, Bhubaneswar	<b>Prof. Mahendra Ku. Mahanti</b> Former Dean, School of Physical Sciences, NEHU, Shillong <b>Prof. Rabindranath Nayak</b> Former Professor, Dept. of Microbiology, IISc, Bangalore. <b>Prof. Sudarsan Nanda</b> Prof. of Eminence & Research Chair, KIIT University, BBSR <b>Prof. Sudhakar Panda</b> Director, NISER & Institute of Physics (IOP), Bhubaneswar.
14	19 <sup>th</sup> (2017) KIIT University, Bhubaneswar	<b>Prof. Damodar Acharya</b> Former Chairman, AICTE & Former Vice Chancellor, BPUT. <b>Prof. Ch. Rajendra Praharaj</b> Former Emeritus Professor, Institute of Physics, BBSR. <b>Prof. Dhruva Raj Naik,</b> Former Vice Chancellor, Sambalpur University. <b>Padma Shri Prof. Subrat Kumar Acharya</b> Former Dean, AIIMS New Delhi
13	18 <sup>th</sup> (2016) OUAT, Bhubaneswar	<b>Prof. Uma Charan Mohanty</b> Former President, Odisha

		Bigyan Academy <b>Prof. Uday Chand Biswal</b> Former Vice Chancellor, Sambalpur University <b>Prof. Surendranath Pasupalak</b> Vice Chancellor, OUAT <b>Dr. Trilochan Mohapatra</b> Secretary, DARE & DG, ICAR
12	17 <sup>th</sup> (2014) ITER, SOA University, Bhubaneswar	<b>Prof. Bhabendra Ku. Patnaik</b> Former Vice Chancellor, Berhampur University. <b>Prof. Sadananda Torasia</b> Former Director, Sci. & Tech. Dept., Odisha. <b>Prof. Chandra Sekhar Sarangi</b> Former Vice Chancellor, Sri Jagannath Sanskrit University <b>Prof. Bhaskar Dash</b> Former Prof. and Head of Chemistry, Utkal University <b>Prof. Gokulananda Das</b> Former Vice Chancellor, Utkal University
11	16 <sup>th</sup> (2013) Institute of Physics, Bhubaneswar	<b>Prof. Amulya Kumar Panda</b> Former Principal, Ravenshaw College <b>Prof. Banchhanidhi Mishra</b> Former Head, Dept. of Botany, Berhampur University <b>Prof. Padma Lochan Nayak</b> Former Head, Dept. of Chem., Ravenshaw College <b>Prof. Pradipta Kishore Dash</b> Director (R&D), ITER,

		<p>SOAUniv., BBSR.  <b>Prof. Swadheenananda Pattanayak</b>                      Former Head, Dept. of Math,                      Sambalpur University</p>
10	<p>15<sup>th</sup> (2012)                      Dept. of Geology,                      Utkal University</p>	<p><b>Prof. Priyambada Mohanty Hejmadi</b>                      Former Vice-Chancellor,                      Sambalpur University  <b>Prof. Somnath Mishra</b>                      Former Principal, NIT, Rourkela  <b>Prof. Premananda Das</b>                      Former Chief Executive, RPRC,                      Bhubaneswar  <b>Prof. Gopabandhu Behera</b>                      Former Head, Dept. of Chem.                      Sambalpur University</p>
9	<p>14<sup>th</sup> (2011)                      OUAT, Bhubaneswar</p>	<p><b>Dr. Bishnu Prasad Das</b>                      Former EIC, Water Resources                      (Odisha)  <b>Prof. (Dr.) Rabindranath Sahoo</b>                      Former Prof. in Neurology,                      SCB Medical College.  <b>Prof. Bimbadhar Nayak</b>                      Former Prof. in Chemistry, IIT,                      Kharagpur.  <b>Prof. Debi Prasad Ray</b>                      Vice Chancellor, OUAT,                      Bhubaneswar  <b>Dr. Achyuta Samanta</b>                      Founder of KIIT &amp; KISS,                      Bhubaneswar</p>
8	<p>13<sup>th</sup>(2010)</p>	<p><b>Prof. Satyananda Acharya</b></p>

	RMNH, Bhubaneswar	Former Vice-Chancellor, Utkal University <b>Prof. Nimai Charan Panda</b> Former Principal, SCB Medical College <b>Prof. Siva Prasad Mishra</b> Former Director, Institute of Physics, Bhubaneswar
7	12 <sup>th</sup> (2009) RMNH, Bhubaneswar	<b>Prof. Basudev Kar</b> Former Principal & Superintendent, SCB Medical College <b>Prof. Madhab Chandra Dash</b> Former Vice-Chancellor, Sambalpur University <b>Prof. Surjyo Narayan Behera</b> Former Vice-Chancellor, Berhampur University
6	11 <sup>th</sup> (2008) KIIT University, Bhubaneswar	<b>Padmabhusan Dr. Trilochan Pradhan,</b> Former VC, Utkal Univ. <b>Dr. Susil Kumar Sinha,</b> Former Prof. of Botany, OUAT
5	10 <sup>th</sup> (2006) OUAT, Bhubaneswar	<b>Dr. Basant Kumar Behura,</b> Former Prof. of Zoology, Utkal University <b>Dr. Iswar Chadra Mahapatra,</b> Former VC, OUAT. <b>Dr. Khageswar Pradhan,</b> Former VC, OUAT. <b>Dr. Prafulla Kumar Jena,</b> Former Director, RRL, Bhubaneswar <b>Dr. Sanatan Rath,</b>

		Former Prof. of Medicine (Neurology), SCB Medical College, Cuttack
4	9 <sup>th</sup> (2005) Institution of Engineers (India), BBSR	<b>Dr. Gokulananda Mohapatra</b> , Former Prof. of Chemistry & Popular Science Writer <b>Dr. Radhanath Rath</b> , Former Prof. of Psychology, Utkal University <b>Dr. Gadadhara Mishra</b> , Former Prof. of Botany, Utkal University
3	8 <sup>th</sup> (2004) RPRC, Bhubaneswar	<b>Dr. Sarat Chadra Misra</b> , Orchidologist (Former Chief Engineer - R&B)
2	7 <sup>th</sup> (2003) Utkal University Bhubaneswar	<b>Dr. Ajit Kumar Pattnaik</b> , Chief Executive, Chilika Development Authority, Bhubaneswar
1	6 <sup>th</sup> (2002) Berhampur University, Berhampur	<b>Dr. Kota Harinarayana</b> , Aeronautical Engineer, Hindusthan Aeronautics, Bangalore <b>Dr. Bibhuti Bhusan Deo</b> , Former VC, Berhmapur University <b>Dr. Prafulla Chandra Tripathy</b> , Former Prof. of Botany, Utkal University <b>Dr. Chandi Charan Das</b> , Former Prof. of Zoology, Berhampur University

## **4. AWARDS INSTITUTED BY OES**

### **(A) Lifetime Achievement Award- presented on OES Foundation Day**

- 2022 **Dr. Bijay Ketan Patnaik**, Former PCCF (Wildlife) & Chief Wildlife Warden, Odisha
- 2021 **Dr. Bharat Panda**, Former Principal, Parsuram Gurukul College, Gajapati
- 2020 **Mr. Saroj Kumar Patnaik**, IFS (Retd.), Former Addl. Principal Chief Conservator of Forests (Wildlife) and Chief Wildlife Warden, Odisha
- 2019 **Dr. Sundara Narayana Patro**, Founder Secretary and Present President, Orissa Environment Society
- 2018 **Dr. Jafran Keshari Roy**, Former Jt. Director, NRRI, Cuttack
- 2017 **Dr. Udaya Narayan Dev**, Ornithologist, Odisha
- 2016 **Prof. Lalit Narayan Patnaik**, Former Chairman, State Pollution Control Board, Odisha
- 2015 **Prof. Satyananda Acharya**, Former Vice Chancellor, Utkal University
- 2014 **Prof. Rebati Charan Das**, Former Vice Chancellor, Berhampur University
- 2013 **Dr. Chitta Ranjan Mohapatra**, Former Principal Chief Conservator of Forests (WL) and Chief Wildlife Warden, Odisha

2012 **Prof. Madhab Chandra Dash**, Former Vice-Chancellor,  
Sambalpur University

### **(B) Environmentalist of the Year**

**(Smt. Parbati Mishra Memorial Award)- presented on World Environment Day**

2022 Not awarded this year

2021 **Mr. Achyut Das**, Director-cum-Secretary, Agragamee (For Natural Resources Management and Tribal Development)

2020 **Mr. Prasanna Kumar Behera**, Nature and Environment Conservation Activist

2019 **Dr Ramesh Chandra Mishra**, Sr. Scientist, ICAR

2018 **Mr. Sudarshan Das**, Environmental Activist

2017 **Prof. Gopala Krushna Panda**, Former Professor of Geography, Utkal University

2016 **Dr Sudhakar Kar**, Former Sr. Research Officer, Forest Dept (Wildlife Wing), Govt. of Odisha

2015 **Dr Lala Aswini Kumar Singh**, Former Sr. Research Officer, Forest Department (Wildlife Wing), Govt. of Odisha

2014 **Dr Chandra Sekhar Kar**, Former Sr. Research Officer, Forest Dept. (Wildlife Wing), Govt. of Odisha. (Posthumous award)

2013 **Dr. Bibhudhendra Pratap Das**, President, Odisha Krushak Maha Sangha

2012 **Dr. Sudarsan Sasmal**, Former Principal Scientist, Central Rice Institute, Cuttack

2011 **Mr. Prafulla Kumar Dhal**, Director, Biswa Research and Innovation Center

2010 **Mr. Biswajit Mohanty**, Wildlife Society of Orissa

### **(C) B. C. Panda Award**

**For Environment and Science Communication- presented on OES Foundation Day**

2022 **Dr. Arun Chandra Sahu**, Former Prof. of Botany

2021 **Dr. Murari Mohan Dash**, Former Reader in Zoology

2020 **Dr. Mayadhar Swain**, Former Director, School of Electrical Engineering, KIIT University, Bhubaneswar

2019 **Dr. Nikhilanand Panigrahy**, Former Director, Odisha Text Book Bureau

2018 **Dr. Suryamani Behera**, Former Professor of Chemistry

2017 **Dr. Ramesh Chandra Parida**, Former Professor of Chemistry, OUAT

2016 **Dr. Jayakrushna Panigrahi**, Past Convener, ISCA Bhubaneswar Chapter

2015 **Dr. Chitta Ranjan Mishra**, Former DGM, NALCO

2015 **Dr. Bijay Ketan Patnaik**, Former PCCF (Wildlife), Odisha

## **5. FELICITATION TO SENIOR LIFE MEMBERS**

Felicitation to Senior Life Members at the Foundation Day Functions 2022.

1. Prof. B. Sitaram Patro, Former Principal, CET, BPUT
2. Er. Binod Chandra Padhi, Former Engineer-in-Chief, Works
3. Er. Harish Chandra Behera, Former Engineer-in-Chief, Water Resources
4. Prof. Nimain Charan Mishra, Former Professor of Entomology, OUAT
5. Shri Biranchi Mishra, Former Jt. Secretary, Tourism and Culture

**Felicitation to Senior Life Members at the Foundation Day Function 2021.**

1. Dr. B. M. Faruque, Former Director, Geological Survey of India
2. Mr. Jitasatru Mohanty, IFS (Retd.) Former Conservator of Forests, Odisha
3. Dr. P. Sasi Bhushana Rao, Former Professor, Dept. of Life Sciences, SKCG (A) College
4. Mr. Swadesh Sundar Patnaik, Former Chairman, Odisha Staff Selection Commission
5. Prof. Nirmal Chandra Dash, Prof. Emeritus, School of Anthropology, KISS University

**2020**

1. Dr. Shailendra Kumar Tamotia, Former Chairman-cum-Managing Director, NALCO
2. Mr. Satya Narayan Bohidar, IFS (Retd.), Former Chief Conservator of Forests
3. Mr. K. Bhaskar Patra, Former Director, Economics and Statistics, Government of Odisha

4. Er. Narayan Mishra, Former Sr. General Manager, GRIDCO
5. Dr. Narayan Sahoo, Former Principal Scientist (IIWM), ICAR

### **2019**

1. Mr. Rama Chandra Patra, Former Under Secretary, OSS
2. Er. Subas Chandra Satapathy, Former Engineer-in-Chief, Water Resources, Govt. of Odisha
3. Er. Muktipada Panda, Former Chief Engineer, Electrical Govt. of Odisha
4. Mr. Debendra Nath Satapathy, Former Superintendent of Police, Govt. of Odisha
5. Er. Umesh Chandra Mohanty, Former Assistant Engineer, Electrical, Govt. of Odisha

### **2018**

- 1 Dr. Seba Mohapatra, Former Director, Health Services, Govt. of Odisha
- 2 Dr. Bhagirathi Behera, IFS (Retd) Former Director, Environment, Govt. of Odisha
- 3 Dr. Sadasiba Biswal, Former Reader in Physics and Principal
- 4 Er. K. Gandhi Choudhury, Former Superintending Engineer, Electrical, Govt. of Odisha
- 5 Mr. Jagabandhu Sarangi, Former Director of Handicrafts, Govt. of Odisha

### **2017**

- 1 Mr. Ramesh Chandra Pani, Former Chairman and MD, Central PSU
- 2 Mr. Rabindra Nath Padhi, Former Deputy Director General, Geological Survey of India
- 3 Er. Somnath Mishra, Former Engineer- in-Chief-cum-Secretary, Works, Govt. of Odisha
- 4 Mr. Sarat Chandra Patnaik, Former District Panchayat Officer, Govt. of Odisha



## 6. FELICITATION TO CONSERVATIONISTS

1. Mr. Rabindranath Sahu, Founder, Rushikulya Sea Turtle Protection Committee
2. Shri Jiban Saha Baba, Founder, Saha Charitable Trust



## 7. FELLOWS OF OES

Life Members of Orissa Environmental Society are nominated as OES Fellows in appreciation of their outstanding contribution and persistent support to the field of Environment and Natural Resources Management. The certificate of Honour as Fellow is presented on the occasion of the Foundation Day of the Society.

**Fellows nominated / honoured on the occasion of the 41<sup>st</sup> Foundation Day, 2022**

None

**Fellows nominated / honoured on the occasion of the 40<sup>th</sup> Foundation Day, 2021**

1. **Dr. Pradip Kumar Pattajoshi**, Asst. General Manager (Environment), NALCO
2. **Prof. Nimai Charan Mishra**, Former Professor (Entomology), OUAT
3. **Dr. Sudhakar Kar**, Former Senior Research Officer, Forest Department

**Fellows nominated / honoured on the occasion of the 39th Foundation Day, 2020**

1. **Dr. Krishna Chandra Sahu**, Former Professor, IIT-Bombay.
2. **Dr. Siba Prasad Adhikary**, Former Vice-Chancellor, Fakir Mohan University
3. **Dr. Soujanendra Swain**, Former Principal Scientist, M.S. Swaminathan Foundation
4. **Dr. Amar Nath Singh**, Assistant Professor, Department of Botany, A.N. College, Dumka (Jharkhand).

**Fellows nominated / honoured on the occasion of the 38th Foundation Day, 2019**

1. **Prof. (Dr) Aruna Kumari Mishra**  
Former Professor of Botany, Utkal University
2. **Prof. Binayak Rath**  
Former Vice Chancellor, Utkal University
3. **Sri Prakash Chandra Mishra**  
President, Odisha Bigyan Academy
4. **Dr. Debabrata Swain**  
Former Principal Chief Conservator of Forests, and Head of Forest Force, Odisha

**Fellows honoured on the occasion of the 37th Foundation Day, 04 November 2018**

1. **Prof. B Sitaram Patro**  
Former Dean, CET, Biju Patnaik University of Technology
2. **Prof. Sailabala Padhi**  
Former Professor of Botany, Berhampur University
3. **Dr. Budurddin Mohammad Faruque**  
Former Director, Geological Survey of India

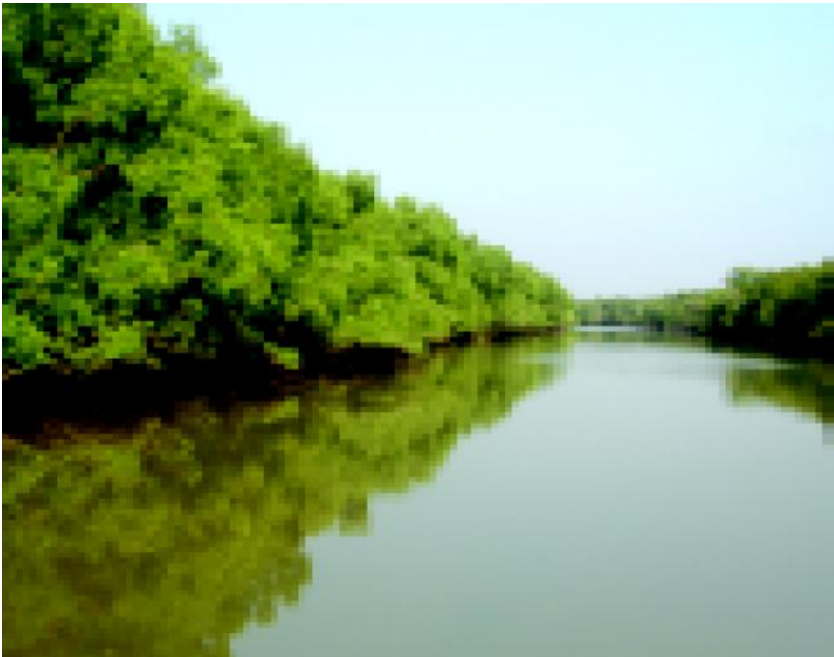
4. **Dr. Lala Aswini Kumar Singh**  
Former Sr. Research Officer (Wildlife) Forest and Environment Dept., Govt. of Odisha
5. **Dr. Chitta Ranjan Mishra**  
Former DGM, NALCO

**Fellows honoured on the occasion of the 36th Foundation Day,  
04 November 2017**

1. **Prof. Satyananda Acharya**  
Former Vice Chancellor, Utkal University
2. **Prof. Amulya Kumar Panda**  
Former Principal, Ravenshaw College (now University)
3. **Prof. Madhab Chandra Dash,**  
Former Vice Chancellor, Sambalpur University
4. **Prof. Debi Prasad Ray**  
Former Vice Chancellor, OUAT
5. **Dr. Bijay Ketan Patnaik, IFS (Retd.)**  
Former PCCF (WL) and Chief Wildlife Warden, Odisha
6. **Er. Binod Chandra Padhi**  
Former Engineer-in-Chief, Odisha
7. **Dr. SachidanandaTripathy**  
Former Professor of Geography, Utkal University
8. **Dr. Bipra Charan Patnayak**  
Former Director, ICAR
9. **Dr. Naba Kishore Mahalik**  
Former Professor of Geology, Utkal University
10. **Dr. Sarat Chandra Mishra**  
Former Chief Engineer (Works), Govt. of Odisha
11. **Mr. Shailendra Kumar Tamotia**  
Former CMD, NALCO

12. **Dr. Sundara Narayana Patro**  
Former College Principal
13. **Dr. Chitta Ranjan Mohapatra,**  
Former Principal Chief Conservator of Forests (WL) and  
Chief Wildlife Warden, Odisha
14. **Prof. Rebati Charan Das,**  
Former Vice Chancellor, Berhampur University
15. **Dr. Jaya Krushna Panigrahi**  
Associate Professor in Zoology
16. **Dr. Jitendra Kumar Sundaray,**  
Head, Division of Fish genetics and Biotechnology, CIFA,

•••



## 8. PATRONS OF OES

Sl. No.	Name/Address	Year of Honour
01.	<p><b>Dr. Shailendra Kumar Tamotia</b>            Hon. Dean-cum-Director General and Vice Chairman,            Bharatiya Vidya Bhavan, Bhubaneswar Kendra            Flat No. D/801, Gymkhana Palm Heights,            Near SUM Hospital, Shampur, PO- Ghatikia,            Bhubaneswar-751003            Mob: 09937011356; Email: sk_tamotia@yahoo.co.in</p>	2015
02.	<p><b>(Late) Dr. Lalit Narayan Patnaik</b>            Former Chairman, OSPCB,            116, Mechatech House, Kalyan Nagar, Cuttack            Mob: 9437000973, Email: lnpatnaik116@gmail.com</p>	2015
03.	<p><b>Dr. Sundara Narayana Patro</b>            Former Reader in Botany and Principal,            MIG-106, Phase-1, Khandagiri Enclave,            Housing Board Colony, Khandagiri, Bhubaneswar            Mob: 09437190420; Email: snpatro11@rediffmail.com</p>	2015
04.	<p><b>Prof. Debi Prasad Ray</b>            Former Vice-Chancellor, OUAT,            House No: HIG -105,(K-5), Kalinga Vihar,            Patrapara, Bhubaneswar-751019            Mob: 09881721435; 08087815770            Email: dpray1949@gmail.com</p>	2015
05.	<p><b>Dr. Jaya Krushna Panigrahi</b>            Reader in Zoology,            41-A, Prachi Enclave, Chandrasekharapur,            Bhubaneswar-751016            Mob: 09437076100; Email: jk.panigrahi@gmail.com</p>	2016

- 06. Dr. Jitendra Kumar Sundaray** **2016**  
Head, Division of Fish genetics and Biotechnology,  
CIFA, Kausalyaganga, Bhubaneswar- 751002  
C/o. Purna Chandra Sundaray,  
At/PO. Aiginia, Bhubaneswar-751019  
Mob: 09437166872; Email: sundarayj@yahoo.com
- 07. Dr. Bipra Charan Patnayak** **2016**  
Former Director, Central Sheep and Wool Research  
Institute (ICAR), S/30, Maitree Vihar, Bhubaneswar  
Mob: 09937000824; Email: bpatnayak@yahoo.co.uk
- 08. Prof. Amulya Kumar Panda** **2016**  
Former Principal, Ravenshaw College,  
73, Cooperative Colony, (Near Chandrasekharpur),  
PO: KIIT, Bhubaneswar-751024  
Mob: 09937440390; Email: amulyapanda39@gmail.com
- 09. Dr. Ashutosh Das** **2018**  
Vice-Chancellor and Director, Center for  
Research and Development, Center for Environmental  
Engg., PRIST University, Tamilnadu, India  
744, Sriram Nagar, Pillaiyarpatti,  
PO- Vallam, Thanjavur- 613403, Tamilnadu, India  
Mob: 09894122821,  
Email: director\_cee@prist.ac.in; acadas@gmail.com
- 10. Dr. Lala Aswini Kumar Singh** **2018**  
Former Sr. Research Officer,  
Govt. of Odisha, Forest Department,  
1830- Mahatab Road, Friends Colony, Old Town,  
Bhubaneswar-002, Mob: 09861092928; 7978335983,  
Email: laksinghindia@gmail.com
- 11. Dr Prakash Chandra Jena** **2018**  
Founder cum President, Ever Green Forum,  
At- Raisar, PO- Narada, Via- Tyendakura,

Dist. -Kendrapada, Odisha-754134  
Mob: 09937623053; Email: prakashjena81@gmail.com

- 12. Dr. B. Seetarama Patro** **2019**  
Former Dean and Prof. Mechanical Eng. BPUT,  
L-1, Housing Board Colony, Baramunda, Bhubaneswar  
Mob: 09437309977; 09556342407  
Email: bspatro@gmail.com
- 13. Dr. Bijaya Kumar Rath** **2019**  
General Manager (Geology), ONGC,  
3rd Floor A2- 06, Hi-Tech Plaza, Sundarpada,  
Bhubaneswar  
Mob: 9643301931, Email: bijay.rath1960@rediffmail.com
- 14. Dr. Chittaranjan Mishra** **2019**  
Former Dy. General Manager, (R and D), NALCO,  
B-3, HIG, Baramunda Housing Board Colony,  
Bhubaneswar  
Mob: 09338204993, Email: crmishra49@yahoo.in
- 15. Dr. (Mrs.) Rekha Das** **2019**  
Former, Secretary, Odisha Bigyan Academy  
130, VIP Colony, Ekamra Vihar, IRC Village,  
Bhubaneswar-751015  
09938454233, E-mail: rekhadas1957@rediffmail.com
- 16. Dr. Seba Mohapatra, M.D. O&G,** **2019**  
Former Director, Health Services, Govt. of Odisha,  
N1, A/10, IRC Village, Bhubaneswar-751015  
09437035531, Email: drsebamohapatra@yahoo.co.in
- 17. Mr. Bimal Krushna Mishra** **2019**  
Director, Tiki Engineering Pvt.Ltd.  
S-72, MaitreeVihar, Bhubaneswar-751023  
Phone: 06742302485, E-mail: bimalkmishra@gmail.com



## 9. LIST OF LIFE MEMBERS (From 2022)

- 729 Behera (Prof.) ShishiraKanta** 09338123879  
(2022) 124/2446, Khandagiri Vihar, Po- Khandagiri,  
Bhubaneswar- 751030  
Email: drshishirabehera@gmail.com
- 730 Nandi (Mr.) Ekadashi** 09437412411  
(2022) Ex. Chief Seed Certification Officer,  
OSSOPCA, Bhubaneswar,  
2090/96, Gothapatna, Po: Malipada,  
Bhubaneswar-751029,  
Email: nandie@rediffmail.com,
- 731 Nayak Sipra** 07008418829  
(2022) Junior Research Fellow,  
At- Swarna Bhabana, Uttara Chhak,  
Dist- Khurda- 751002  
Res: Mahaveer Colony, Po: Panikoili,  
Dist: Jajpur- 755043  
Email: nayaksipra2@gmail.com
- 732 Mohapatra (Mr.) Himansu Sekhara** 09437766156  
(2022) Lecturer in Botany,  
Kendrapara Autonomous College,  
Kendrapara, Odisha-754211,  
Email: himansusekhar@gmail.com
- 733 Acharya Diptimayee,** 09437747231  
(2022) Deptt. of Zoology, SSB College,  
Mahakalpara, Kendrapara- 754224  
At- Kheras, Po- Brahmansailo, Dist.- Cuttack, Pin- 754018  
Email: dmacharya27@gmail.com

- 734 Beura (Dr.) Sashikala** 09861138029  
(2022) Professor & Head, (Floriculture & Land Scaping), OUAT  
MIG-141, Phase-I, Khandagiri H.B.Colony,  
Kolathia, Bhubaneswar- 751030  
Email: skbeura2002@yahoo.co.in
- 735 Jagadev (Dr.) Prema Narayan** 09861128437  
(2022) Professor (Pant Breeding and Genetics), OUAT  
MIG-141, Phase-I, Khandagiri H.B.Colony,  
Kolathia, Bhubaneswar- 751030  
Email: pnjagadev@yahoo.ci.in
- 736 Rath (Mr.) Prasad** 09999113132  
(2022) BDS (Bachelor of Dental Surgery) Student  
A/ 163, Sahid Nagar, Bhubaneswar 751007  
Email: prasadrath19@gmail.com
- 737 Panda (Dr.) Swati** 09439938772  
(2022) Assoc. Prof. of Zoology,  
Salepur College, Salepur; Cuttack-
- 738 Mohanty (Mr.) Akshaya Kumar** 07008959706  
(2022) I/C Headmaster, At- Panisalia, Po/Dist. Jagatsinghpur,  
At- Panitira, Po- Osakana, Ps- Balikuda,  
Via- Machhagaon, Dist- Jagatsinghpur, Pin- 754119  
Email: akshayamohanty67@gmail.vom,
- 739 Dash (Mr.) Prakash Ranjan,** 09178760226  
(2022) Head Master,  
At- Markandapur (Gopal sagar),  
Po/Dist.- Jagatsinghpur, Pin- 754103  
Email: prakashranjandash10@gmail.com
- 740 Khan (Dr.) Muntaz** 08763593996  
(2022) Asst. Prof. in Zoology,  
Deptt. of Zoology, Kalahandi University,  
Manikya Vihar, Bhawanipatna, Kalahandi 766001

S/o – samir Khan, At- Mirbagh, Po- Athantar,  
Via-/Ps- Balipatna, Dist- Khordha,  
Email: soneyal@yahoo.co.in

- 741 Khuntia (Sri) Nirada Barana** 08093109093  
(2022) Teaching Faculty-NSS- ETI, OUAT  
13P/1960, Mohandas Enclave, Kolathia, Khandagiri,  
Bhubaneswar, Email: nbk045@gmail.com
- 742 Puhan (Shri) Biswanath** 07978835015  
(2022) Former Manager, NABARD  
MIG-11, Phase-I, Khandagiri H.B.Colony, Lane-6, Khandagiri,  
Bhubaneswar-751030, Email: puhanbiswanath@gmail.com
- 743 Panda (Mr.) Akshya Kumar** 09312345209  
(2022) Advocate,  
DI- 198, Satya Marg, Chanakyapuri, New Delhi,  
D7-100, Kendriya Vihar, Tamando, Bhubaneswar  
Email: akshyap@gmail.com
- 744 Naidu (Mr.) Dadi Sanyasi** 08247204279  
(2022) Housing, 50-96-12, Seetamadara,  
Visakhapatnam, Andhrapradesh, Pin- 5330013  
Email: sndadi@gmail.com
- 745 Panda (Mr.) Ramesh Panda** 09406905021  
(2022) Former CGM, SRI  
B- 901, Vipul Green, Infront of AIIMS,  
Ranasinghpur, Sijua, Bhubaneswar- 751015  
Email: rameshpanda1204@gmail.com,
- 746 Dash (Er.) Bimal Chandra** 09437044785  
(2022) Former Additional Chief Engineer (PWD)  
Plot No. 1654/4332, Dhabaleswar Vihar,  
Kala Rahanga, Patia, Po- KIIT, Bhubaneswar- 751024  
Email: bimal\_dash23@yahoo.co.in

- 747 Tripathy (Er.) Rama Chandra** 09437026220  
**(2022)** Former Group General Manager, NALCO  
MIG- 40, Housing Board Colony,  
Phase-I, Lane-6, Khandagiri Enclave, Bhubaneswar – 751030  
Email: rctripathy2005@gmail.c om
- 748 Patnaik (Mr.) Sukant Patnaik** 09437065577  
**(2022)** Manager (Admn.) Retd.  
IREL (India) Ltd., Gajapati Nagar, 6<sup>th</sup> Lane,  
Berhampur – 751010, Ganjam(Odisha)  
Email: sukantpr@gmail.com
- 749 L. Vijayaraghavan** 09739373021  
**(2022)** Visiting Professor,  
66, K.M. Nilayam, 3<sup>rd</sup> Main Road, Srirampuram,  
Bangalore- 560021  
Email: lraghavan@rediff.com



## 10. OES PUBLICATIONS

01. Environment and Natural Resources Management 1983
02. Mass Mobilization Campaign on Wildlife 1984  
(Black Buck) Conservation
03. Environmental Conservation 1984
04. Conservation of Similipal in its Wilderness 1985
05. Environment and Indira Gandhi (Odia) 1986
06. Chilika: The Pride of our Wetland Heritage 1986
07. Environment and Sustainable Development 1990
08. My Home (Cost Reduction Techniques and  
Low-Cost Materials for Rural Housing 1990
09. Public Hearing on Environment and  
Development Strategies-Orissa Report 1991
10. Mahendragiri: The Pride of Eastern Ghats 1991
11. Environment Conservation Movements in Orissa 1991
12. Noise Pollution 1992
13. Save Environment: Save Yourself 1992
14. Eastern Ghats in Orissa: Environment, Resources 1994  
and Development
15. Spatial Dimension of Geography 1995
16. Useful Plants for Diabetes 1997
17. Similipal: A Natural Habitat of Unique Biodiversity 1998
18. Auto- Vehicular Pollution (Odia) 1998
19. Biodiversity Conservation: Problem and Prospects 1998
20. Keep Our Water Resources Clean (Odia) 1999
21. Kathina Barjyabastu Parichalana (Odia) 2000
22. Manaba Sebare Udbhida (Odia) 2001
23. Sahania Bikash (Odia) 2002

24. Jala o Jibana (Odia) 2003
25. Jibana Paain Jala (Odia) 2004
26. Kathina Barjyabastu (Odia) 2005
27. Kathina Barjyabastu: Samasya Ebam Nirakaran (Odia) 2006
28. Kathina Barjyabastu: Eka Samikhya (Odia) 2007
29. Souvenir: Silver Jubilee Commemoration Volume 2007
30. Jaiba Bibidhata: Eka Samikhya (Odia) 2008
31. Biswa Tapan Ebam Jalabayu Paribartan (Odia) 2009
32. Jalabayu Paribartan: Eka Samikhya (Odia) 2010
33. Mahendragiri (English) 2010
34. Jaiba Bibidhata (Odia) 2011
35. Nirantara Jiban Dharana Paain Aranya (Odia) 2012
36. Manaba Sebare Jaiba Bibidhata (Odia) 2013
37. Orissa Environmental Society- A Profile 2013
38. Jaiba Bibidhata (Odia) 2014
39. Jayadev Vatika (English) 2015
40. Orissa Environmental Society- Annual Report 2016
41. Lectures on Environment and Science, Annual Report 2017
42. Lectures on Environment and Science, Annual Report 2018
43. Lectures on Environment and Science, Annual Report 2019
44. Lectures on Environment and Science, Annual Report 2020
45. Lectures on Environment and Science, Annual Report 2021

Besides the above publications, the Society has brought out a good number of souvenirs, proceedings and research reports.



## 11. EXECUTIVE COMMITTEE OF OES INCLUDING OFFICE BEARERS

### Executive Committee 2021-2024

<u>Sl.</u>	<u>Name and Address with E-mail</u>	<u>Designation</u>	<u>Contact No</u>
01	<b>Dr. Sundara Narayana Patro</b> Former College Principal MIG-106, Phase-I, Khandagiri Enclave, Khandagiri, Bhubaneswar-751030 Email: snpatro11@gmail.com	President	09437190420
02	<b>Dr. Bijay Ketan Patnaik, IFS, (Retd.)</b> Former PCCF, (Wildlife) and Chief Wildlife Warden, Odisha, 57, Jagamohan Nagar, Jagamara, Khandagiri, Bhubaneswar - 751 030 Email: bijayketanpatnaik@yahoo.co.in	Vice President-I (EMD)	9437000904 0674-2553182
03	<b>Dr. Lala Aswini Kumar Singh</b> Former Sr. Research Officer, Office of PCCF (WL), Odisha, 1830- Mahatab Road, Friends Colony, Old Town, Bhubaneswar-751002 Email: laksinghindia@gmail.com, Email: laksingh2005@yahoo.co.in	Vice President-I (EAP)	09861092928 07377727949 0674-2565019
04	<b>Dr. Jaya Krushna Panigrahi</b> Former Principal, MCNL and HoD of Zool. & Env. Sc., SJCET 41-A, Prachi Enclave, Chandrasekharpur, Bhubaneswar-751016 Email: jk.panigrahi@gmail.com	Secretary	0674-2741542 09437076100

- 05 **Er. Manaranjan Mishra,** Joint Secretary 7894454052  
Former Vice President, SMS India Pvt. Ltd.,  
Flat No. - F093, The Cosmopolis,  
Dumduma, Bhubaneswar-751019  
E-mail: mmkb108@gmail.com
- 06 **Dr. B. Seetarama Patro,** Treasurer 0674-2354330  
Former Dean & Prof. Mechanical Eng. BPUT, 09437309977  
L-1, Housing Board Colony, Baramunda, 09556342407  
Bhubaneswar - 751003,  
Email: bspatro@gmail.com
- 07 **Er. (Dr.) Prakash Chandra Jena,** Member 09937623053  
Director, Ever-Green Forum, 09437572053  
LIG- 877, K-4, Kalinga Vihar,  
Po: Patrapada, Bhubaneswar-751019  
Email: prakashjena81@gmail.com
- 08 **Dr. Sudhakar Kar,** Member 09438054614  
Former Sr. Research Officer,  
Office of PCCF (WL), Odisha,  
Durga Madhab Nagar, (Lane-1),  
Near Central Ayurvedic Research Centre and  
Hospital, Sampur, Po- Ghatikia, Khandagiri,  
Bhubaneswar- 751003,  
Email: kar.sudhakar@gmail.com
- 09 **Dr. Pradeep Kumar Rath,** Member 033-22895797  
Former Dy. Chief Labour Commissioner, 09433941340  
Govt. of India 09437500556  
A/ 102, Baishnab Vihar Apartment, Bomikhal,  
Bhubaneswar- 751010.  
Email: pkrath.cls@gmail.com

- 10 **Mr. Raghunath Prusty,** Member 07537004449  
Former Chief Manager, Allahabad Bank,  
Flat No. -103, Tower-10,  
Vipul Gardens, Ghatikia, Bhubaneswar-751003  
Email: rnprusty00782@gmail.com
- 11 **Mr. Prakash Chandra Mishra, IFS (Retd.)** Member 09437193175  
Former Chief Conservator of  
Forests & Addl. P.D.  
A/4, Brindavan Enclave, Khandagiri,  
Bhubaneswar-751030  
Email: pcmforest1999@gmail.com
- 12 **Dr. Jitendra Kumar Sundaray,** Member 09437166872  
Head, Division of Fish Genetics &  
Biotechnology, CIFA  
C/o. Purna Chandra Sundaray,  
At.Po. Aiginia, Bhubaneswar-751019  
Email: sundarayj@yahoo.com
- 13 **Mr. Guru Charan Das** Member 09437109321  
Former Director, Geological Survey of India  
Journalist Colony, Madhusudan Nagar,  
Tulsipur, Cuttack-753008  
Email: 31.7gurudas@gmail.com
- 14 **Prof. Nimai Charan Mishra,** Member 0674-2397964  
Director PME, OUAT, 09437627729  
Plot No. 1830/ 2652, Mahatab Road,  
Bhubaneswar - 751002  
Email: nimai.mishra2011@gmail.com
- 15 **Dr. Kunja Bihari Satpathy,** Member 0674-2540873  
Emeritus Professor of Botany, Centurian Univ., 09861126749  
Plot No. 55/ 1735, Acharya Vihar,  
Bhubaneswar-751013  
Email: kbs\_bot@rediffmail.com

- 16 **Kumar (Dr.) Prasanna,** Co-Opted Member 0674-2300733  
Former Senior Scientist, ORSAC 09437137531  
House No: C/100, Lingaraj Vihar,  
Pokhariput, Bhubaneswar-751 020  
Email: pkumarorsac@gmail.com
- 17 **Prof. (Dr.) Rama Chandro Misro,** Co-Opted Member  
Professor of History, Plot no. B2/41, 09437193073  
Lingaraj Vihar, Pokhariput,  
Bhubaneswar-751020  
Email: rcmisro@gmail.com
- 18 **Ms. Debi Priyadarshini,** Co-Opted Member  
Scientist-C, Regional Museum of 07834890048  
Natural History (MoEF & CC), Po- RRL,  
Acharya Vihar, Bhubaneswar 751013  
Email: devispiders@gmail.com
- 19 **Mrs. Sunita Kumari Patro** Co-Opted Member  
H-19, TRL- Krosaki Colony, 09238595859  
Belpahara, Dist.-Jharsuguda  
Email: sunitapatro120173@gmail.com
- 20 **Mr. Rama Chandra Patra,** Administrative 0674-2558648  
OSS (Retd.), Officer 09337872220  
N-4 / 60, IRC Village,  
Bhubaneswar - 751015  
Email: rcpatrairc@gmail.com



## 12. ADVISORY BODY

1. **Prof. Debi Prasad Ray**  
Former Vice Chancellor, OUAT
2. **Prof. Siba Prasad Adhikary**  
Former Vice Chancellor, FM University
3. **Dr. Virendra Pratap Upadhyay**  
Former Advisor, MOFFCC
4. **Mr. Swadesh Sundar Patnaik**  
Former Chairperson, Staff Selection Commissioner
5. **Dr. Chitta Ranjan Mishra**  
Former General Manager, NALCO



## 13. OBITUARY

Members of OES have offered deep condolences for the following departed souls.



**28 September 2022**

Dr. Bhagirathi Behera, IFS and Former Director, Environment to Government of Odisha, Forest, Environment and Climate Change Department. He was a Life Member of OES.



**15 February 2023**

Dr. Subash Chandra Patra. He was a Life Member OES.



**22 February 2023**

Mr. Nanda Kishor Bindhani. He was a Life Member of OES. He served the Odisha Government as Under Secretary at Home and Finance Departments.



**26 March 2023**

Smt. Saubhagya Patro, wife of Dr. Sundara Narayana Patro, President, Odisha Environment Society. Madam Patro was a very affectionate person for all who ever had a chance to meet her at the headquarters or in the field in the jungles of Odisha. We pray God for her peaceful stay in the heavenly abode, and continue her inspirations for Dr. Patro and the many-fold institutions and contacts he has created and nurtured for forty-two years.



**29 April 2023**

Dr. D. P. Ray, Life Member and Member of OES Advisory Body, He was Vice Chancellor of the Orissa University of Agriculture and Technology.

## 14. OES MEMBERSHIP APPLICATION FORM

### **Orissa Environmental Society**

(Registered under Societies Registration Act 1860,

Regd. No. PBN 100/19 of 1982-83

And Foreign Contribution (Regulation) Act 1996,

Regd. No. 104830132 of 2003

ND-4, VIP Area, IRC Village, Bhubaneswar-751015, Odisha, India

Telephone: 91-674-2557423, Email: oesbbsr@gmail.com,

Website: www.odishaenvironment.org

### **APPLICATION FORM FOR MEMBERSHIP**

To

The Secretary, Orissa Environmental Society,

ND-4, VIP Area, IRC Village,

Bhubaneswar (Orissa, India) - 751015

Dear Sir,

I wish to be enrolled as an Annual Member\*/ Life Member of the Orissa Environmental Society.

**(In case of individuals)**

We wish to enrol our Organization/Institution/Department as an Institutional Member of the Orissa Environmental Society.

**(In case of Organization/Institution/Department)**

Enclosed herewith, please find the bank draft/\*cheque/cash for an amount of Rs. \_\_\_\_\_

(Rupees \_\_\_\_\_) only towards individual- annual / life membership subscription; Institutional Membership subscription (Strike words not applicable).

**Details of Individual**

Name in full (block capital letters) \_\_\_\_\_

Designation \_\_\_\_\_

Present Address (with pin code) \_\_\_\_\_

\_\_\_\_\_

Telephone \_\_\_\_\_, Fax \_\_\_\_\_,

e-mail \_\_\_\_\_

Permanent Address (with pin code) \_\_\_\_\_

\_\_\_\_\_

Telephone \_\_\_\_\_, Fax \_\_\_\_\_,

e-mail \_\_\_\_\_

Date of birth \_\_\_\_\_

Academic qualification \_\_\_\_\_

(Attach copy of the last educational qualification certificate)

Brief note on the activities (attach separate sheet)

**Details of Institution/ Organisation/ Department**

Name of the Organization \_\_\_\_\_

(Attach copy of the registration certificate in case of Non-Government Organization/ Trust/ Company)

Address (with pin code) \_\_\_\_\_

\_\_\_\_\_

Telephone \_\_\_\_\_, Fax \_\_\_\_\_,

e-mail \_\_\_\_\_

Contact person \_\_\_\_\_

Brief note on activities (attach separate sheet)

**Signature with date** \_\_\_\_\_

**Kindly read objectives, membership fees, instruction, etc. below**

*\*Send an additional amount of Rs. 70/- (Rupees seventy) only in case of outstation cheques towards collection charges.*



## **Orissa Environmental Society**

ND-4, VIP Area, IRC Village,

Bhubaneswar-751015, Odisha, India

Email: oesbbsr@gmail.com

Website: [www.odishaenvironment.org](http://www.odishaenvironment.org)

The quality of life on the Earth is fast deteriorating consequent upon resource depletion and environmental degradation. This poses a threat to the very existence of the mankind and all other forms of life. The challenge before us now is the reversal of this situation through enrichment of the environment and conservation of the natural resources for a sustainable future. The World Conservation Strategy defines sustainable development as the kind of development that meets the needs of the present without compromising the ability of the future generation to meet their own needs. In other words, it means improving the quality of human life while living within the carrying capacity of the supporting ecosystem. Realising this, the Orissa Environmental Society (OES) was founded in 1982 to promote education and awareness on the fast deteriorating quality of human environment and the need for conservation of the Nature.

### **Objectives**

- Promote knowledge, understanding and appreciation of nature, and the principles and practices of conservation of natural resources among the common mass.
- Establish contact with regional, national, and international organizations, the Department of Environment and other such departments/agencies of the State as well as the Union Government so far as these contacts are beneficial to the Society or its objectives.
- Advise the government and non-government agencies on the environmental matters in the public interest.
- Conduct and encourage activities like tree plantation, nursing,

habitat conservation, education and awareness programmes- padayatra, mass mobilization campaign, workshop, seminar, conference, training, popular lecture, exhibition, competitions, study, survey, research, publication of proceedings, books, brochures, bulletins, extension materials etc. towards protection, regeneration and conservation of environment and natural resources.

- Frame curricula and co-curricula, and organize courses on environmental sciences at all levels of education.
- Work regardless of race, religion and political belief.
- Adopt any other means that might be advantageous to the Society's objectives.

**DETAILS OF SUBSCRIPTIONS**

<b>Member</b>	<b>Individual</b>	<b>Institution</b>
Life	Rs.2,000	Rs.25,000
Annual*	Rs.200	-

Payment should be made in shape of bank draft in the name of Orissa Environmental Society to be drawn on any nationalized bank in Bhubaneswar. \*In case of out station cheque an additional amount of Rs. 70/- (Rupees Seventy) only should be paid towards collection charges.

\*The annual subscription year- 1<sup>st</sup> April to 31<sup>st</sup> March

**FOR OFFICE USE ONLY**

Money Receipt No. \_\_\_\_\_, dated \_\_\_\_\_,  
 Membership No. \_\_\_\_\_ Bank Draft/Cheque No. \_\_\_\_\_,  
 dated \_\_\_\_\_ Name and address of the bank on which to  
 be drawn \_\_\_\_\_ Name and address  
 of the draft/cheque issuing bank \_\_\_\_\_

## 15. OES FELLOW- GUIDELINES

In the bylaws of Orissa Environmental Society there is a provision of 'Fellow' (under article IV (b)- Category of Members). The Society is going to award the certificate of honour as 'Fellow' to the Life Members from the current year.

Interested members are requested to furnish the relevant information as per the format (Annexure -1). Enclosed please find the guidelines suggested by the OES Fellow Nomination Committee.

### **Guidelines for selection**

1. The total strength of OES-Fellows in any year will remain at a maximum of 20% of the number of existing OES Life Members. The calculation will be based on the strength of Life Membership by 25 October each year, which is the Foundation Day of OES.
2. In the first year (2016 as base year), 5% of the total Life Members will be nominated as the Founder Fellows of OES. All eight Patrons of OES, as on 20 Oct, 2016, may be included in the list of "Founder Fellows" as all of them have made significant contributions towards environment. In the starting year, up to 30 (thirty) "Founder Fellows" may be nominated by the Executive Committee of OES.
3. In subsequent years 5 (five) Fellows may be selected out of about 10 (ten) identified or invited nominations.
4. It is not necessary to award the honour of 'Fellow of OES' every year, if suitable nominations do not come forth.
5. Individuals or organisations nominated for consideration should have done noticeable field work and made significant contributions to the fields of science and technology, and environment.
6. Normally, the nominee should have been a Life Member of OES for 5 (five) years

7. Life Members who are Patrons of OES and have demonstrated significant contributions towards environmental protection shall be considered for nomination, even if they have not been Life Members for five years.
8. Life Members who have been felicitated with 'Lifetime Achievement Award' by OES will ordinarily be considered for award of the honour as 'Fellow of OES'.
9. Persons who are not Life Members yet but have very significant contributions in the field towards environment protection/ conservation / research may be nominated for consideration for award of the honour as 'Honorary Fellow of OES'.
10. Biographical profiles will be requested from nominees and considered for final selection.
11. Financial mechanism to meet the expenses- the nominees will be appealed for paying a 'goodwill subscription' of at least Rs.2000/- (Rupees two thousand) only for promoting environment protection. The amount donated to Orissa Environmental Society qualify for deduction U/S 80G (5) of the IT Act 1961.
12. Draft Application Format for record of the Society has suggested in Annexure-I.
13. An Undertaking/ Oath as in Annexure-II will be taken by the OES-Fellow



**Annexure-I**

**OES Fellow Guideline**

**Orissa Environmental Society**

(Resume of Prof./ Dr. ----- ‘Fellow’ of OES)

- (1.) Name of the applicant:
- (2.) Present address and occupation:
- (3.) Date of birth:
- (4.) OES Life Membership No. with year:
- (5.) Academic qualification:
- (6.) Significant contribution in the field of science, technology and environment:  
(Mention within maximum ten lines only):
- (7.) Awards, Felicitations, Honours, etc. received:
- (8.) Contribution to the activities of Orissa Environmental Society to achieve its objectives, and welfare of the society in general.

*The information furnished is true to the best of my knowledge*

Signature with date

(Full Name:.....)

**Annexure-II**

**OES Fellow Guideline**

**Undertaking**

“I----- the undersigned, do hereby subscribe to the obligation that I will make endeavour to promote the interest and welfare of the Orissa Environmental Society for the furtherance of its objects, and observe its rules and regulations so long as I shall continue to be a Fellow thereof”.

Signature with date

(Full Name:.....)



**Orissa Environment Society**

**ND-4, VIP Area, IRC Village, Bhubaneswar - 751015**

www.odishaenvironment.org; oesbbsr@gmail.com

0674-2557423

**Nomination Form for Award of the Certificate of Honour as  
'Patron'**

1. Name of the applicant:
2. Present address and occupation:
3. Date of birth:
4. OES Life Membership No. with year:
5. Academic Qualification:
6. Significant contribution in the field of environment, natural resources, science & technology: (Mention within maximum ten lines only):
7. Awards, Felicitations, Honours, etc. received:  
(Supporting documents may be attached)
8. Contribution to the activities of Orissa Environmental Society to achieve its objectives.

Signature with date

(Full Name:.....)

**Undertaking**

"I \_\_\_\_\_ the undersigned, do hereby subscribe to the obligation that I will make endeavour to promote the interest and welfare of the Orissa Environmental Society for the furtherance of its objects, and observe its rules and regulations so long as I shall continue to be a Patron thereof".

Signature with date

(Full Name:.....)

## 17. OES - FIELD ACTIVITY

### 17.1. CLEAN AND GREEN CAMPAIGN 2022

As the world is struggling to combat climate change, one idea - planting trees - seems to be taking hold as a panacea for curing the ills of pollution, soaring carbon emissions, and degrading soil health. India is no exception to the adverse climate change impacts. India is already suffering from weather aberrations, and deadly heat waves and every forthcoming summer might be India's hottest summer ever.

Many cities across the world are increasingly planting trees to protect themselves from adverse climate change impacts like heat waves and floods. Urban officials and environmental experts say planting trees is not only beneficial to the environment but also improves people's physical and mental health. Planting more trees helps in reducing air pollution, improving the urban environment and reducing the impacts of climate change. Trees and green areas lower stress levels and facilitate people to live in harmony and peace and socialize more.

However, as the world is getting more and more urbanised, demand for housing and transport is putting pressure on green areas, which leads to the replacement of green surfaces with concrete surfaces. It is essential for each city/state to preserve a sufficient amount of green cover to maintain environmental stability and ecological balance.

The message is everywhere – plant more trees. As we sizzle or swelter through a record-breaking summer and read the dire warnings of the latest IPCC (Intergovernmental Panel on Climate Change) report on how the climate crisis will only get worse if we don't act now, tree planting is one way - city dwellers can mitigate the worst of its impact.

There is no argument about the multiple benefits trees bestow – starting with carbon sequestration or capturing and storing atmospheric carbon dioxide and thereby reducing the amount in the atmosphere and abatement of the global warming.

But just planting trees is not a cure-all for tackling global warming and climate change, multiple studies have found. Right from selecting the correct species to then monitoring and maintaining saplings and planning for large-scale tree plantation, effective tree plantation goes beyond just planting of the tree.

Looking into the imminent threat of the climate change impact across the globe, Orissa Environmental Society (OES) has been actively working through its “Clean & Green Campaign” programme relentlessly since 2018. The objective is to bring awareness amongst the young minds in both urban and rural areas about the significance of tree plantation, environmental pollution, ill effects of “Single Use Plastic”, water and energy conservation, waste management, etc.

This year i.e in 2022 OES undertook plantation of about twenty thousand different kinds of species successfully in nine regions under the respective Regional Business Offices (RBO). These regions cover several districts of Odisha state such as: Khordha, Nayagarh, Cuttack, Jagatsingpur, Ganjam, Gajapati, Rayagada, Koraput, Navrangpur, Kalahandi, Phulbani and Kandhamal. Thanks to the State Bank of India authorities for awarding this ‘Mega Tree Plantation Project’ reposing trust and confidence in OES. Er. Manaranjan Mishra, Joint Secretary, OES was designated as Coordinator for this mega-plantation project, who have put in a lot of efforts, worked very hard and executed it with undiluted commitments.

Life Member Mr. Ramesh Chandra Panda, retired Chief General Manager of SBI played the key role and was

instrumental in forging a relationship with SBI local head office and making it possible to get this project awarded. In pursuant to this, the strategic approach made by president Dr. S. N. Patro, Secretary Dr. J. K. Panigrahi, and Joint Secretary Er. Manoranjan Mishra, along with other office bearers and members is appreciable. Different areas were assigned to dedicated members and their associates for smooth execution of the work in coordination with the local officer(s) representing SBI and host institutions. The following life members were assigned the responsibility of different regions:

RBO Khordha: Mr. Nirad Baran Khuntia

RBO Jagatsinghpur : Mr. Utkal Ranjan Mohanty

RBO Cuttack: Er. Manoranjan Mishra

RBO Berhampur: Mr. Sukanta Patnaik

RBO Aska: Mr. Sukant Patnaik

RBO Rayagada: Er. Bimal Dash, Mr. A. Jagannath Raju & Mr. Sukanta Maharana

RBO Jeypore: Er. Bimal Dash, Mr. Pradeep Kumar

RBO Bhawanipatna: Er. Bimal Mishra

RBO Phulbani: Er. Bimal Mishra

OES life members Mr. Biswanath Puhan, Mrs. Swapna Behera and EC Coopted member Mrs. Sunita Kumari Patro were continuously involved in various grass root level activities of this mega plantation project. OES also joined hands with several other organizations in this foray.

OES planted altogether 18,227 tree saplings (17,900 nos under 'SBI Mega Plantation Project', and 327nos under OES 'Clean and Green Campaign' programme) and was participated by 7028 number of people. They include school and college students, teachers and villagers.

## 17.2. MEGA PLANTATION PROGRAM

(17,900 Saplings with 5969 participants)

**SBI RBO Aska - 2100 Saplings with 290 participants**

Date	Location of Plantation	No of Participants	No of Saplings
2.11.22	Kendriya Vidyalaya, Aska	255	1600
10.11.22	Kendriya Vidyalaya, Aska	35	500



**SBI RBO Berhampur - 2000 saplings with 995 participants**

19.10.22	Sakaleswar High School, Bikrampur	180	180
19.10.22	Odisha Adarsha Vidyalaya, Ganjam	165	100
21.10.22	Odisha Adarsha Vidyalaya, Chamakhandi	230	300
26.10.22	KM Science College, Narendrapur	85	150
28.10.22	Parala Maharaj Engineering College	60	250
11.11.22	Parala Maharaj Engineering College	45	200
11.11.22	Saraswati Sishu Mandir, Nilakantha Nagar	175	200
19.11.22	Parala Maharaj Engineering College	55	680



**SBI RBO Rayagada - 2100 Saplings with 741 participants**

06.11.22	District Panchayat Resource Center, Rayagada	32	300
09.11.22	Govt ITI Hostel Campus, Rayagada	45	200
11.11.22	Govt U.P. School, Kodes, Pitamahal,	88	260
24. 11.22	Police Barrack, Sanskrit College, MRB HS, and Sri Jagannath Mandir village area	76	500
28. 11.22	Sri Aurobindo School, Panch mile village, Home of Life Hostel, Raj Sitapur U.P.School, Gurandi police station, Gurandi High School	285	480
12.12.22	KulundaGuda, Tutabada, Ram Nagar, Pharsamba Villages in Gumma Block	215	430



**SBI RBO Jeypore - 2100 Saplings with 578 participants**

03.11.22	R.I. Training Institute, Phulabeda, Jeypore	62	500
05.11.22	Ambaguda High School, Ambaguda, Jeypore	178	700
15.11.22	Gadapadar High School, Gadapadar, Jeypore,	115	300





**SBI RBO Jagatsinghpur - 2500 Saplings with 1542 participants**

28.10.22	Kriya Yog Ashram, Jagannathpur	25	110
28.10.22	GadibrahmaVidyapitha, Kaduapada	65	50
29.10.22	St. Xavier High School, Balikuda	93	50
30.10.22	Srikrishna Gurukula, Jayagaon, Balikuda	18	70
30.10.22	Narayani Pitha, Oshakana, Balikuda	46	150
01.11.22	Saraswati Sishu Vidya Mandir, Kalio	160	60
01.11.22	NilakantheswarVidyapitha, Bhoda	65	50
04.11.22	Govt High School, Gelapur	85	50
04.11.22	Maindipur U.P. School, Gelapur	64	50
06.11.22	Banisrikhetra, Ichhapur	35	100
06.11.22	Jeera Village	25	50
10.11.22	Sri Jagannath Vidyamandir, Uchanuagaon	87	150
10.11.22	Nilakantheswar Mandir, Kunjakothi	16	100



**SBI RBO Cuttack - 2500 Saplings with 582 participants**

14.10.22	Balashram, Khapuria, Cuttack	12	570
19.10.22	Gokhale Ideal Higher Secondary School	380	400
19.10.22	Gandhi Vidyapitha, Sankarpur	65	200
12 <sup>th</sup> -15 <sup>th</sup> Nov'22	Odisha Adarsh Vidyalaya, Ramdaspur	125	1330



**OES Plantation Program: 327 Saplings with 1059 participants**

04. 07. 22	Rajdhani Engg College, BBSR	180	200
07. 07.22	Neelakantha Govt HS, Nanput, Khordha	145	10
13. 07. 22	Bhramarbar Nodal HS, Tamando	45	10
23. 07. 22	Mahendragiri Hill Top, Gajapati	45	50
26. 07. 22	Maa BasuleiVidyapitha, Nuagarh Astarang, Puri	95	8
29. 07. 22	Jagannath Prasad Govt High School Andharua, BBSR	105	10
05. 08.22	KPP Anchalika Degree Maha Vidyalaya, Malipada, Khordha	66	7
06. 08. 22	Govt. High School, Daruthenga, BBSR	68	5
29. 08.22	Maharana Birabara Nodal Vidyapitha	185	17
03. 09. 22	Bapuji Nodal Vidyapitha, Barimunda	125	10



## **ORISSA ENVIRONMENTAL SOCIETY**

ND-4, VIP Area, IRC Village, Bhubaneswar-751015, Odisha, India  
Web: [odishaenvironment.org](http://odishaenvironment.org), Email: [oesbbsr@gmail.com](mailto:oesbbsr@gmail.com)