



## ACTIVITY REPORT

1<sup>st</sup> April 2014 to 31<sup>st</sup> March 2015

**International Society of Environmental Botanists (ISEB)**  
**CSIR-National Botanical Research Institute (CSIR-NBRI)**  
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International Society of Environmental Botanists (ISEB) is engaged in activities related to promoting environmental protection, biodiversity conservation and sustainable use of bioresources. Under these objectives following activities were carried out during the period.

**1. Environews:** A quarterly news letter of ISEB (4 issues were published during the year).

**ENVIRONNEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
*Newsletter*

LUCKNOW (INDIA) VOL 20 No 2 (ICPEP-5 Special Issue) April, 2014

**Fifth International Conference on Plants and Environmental Pollution (ICPEP-5)**

Date: 3-6 December 2014 Venue: Lucknow, India

**Organized by**

**International Society of Environmental Botanists (ISEB)**  
&  
**CSIR-National Botanical Research Institute (CSIR-NBRI)**

Chairman, Organizing Committee  
**Dr. C.S. Nairiyal, FNA**  
Honorary CSIR-NBRI & President ISEB

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INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
*Newsletter*

LUCKNOW (INDIA) VOL 20 No 3 July, 2014

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**Professor Sagar V. Krupa R.I.P.**

We deeply mourn the demise of Prof Sagar V. Krupa, a life member and an Advisor of ISEB. Both for ISEB and ICPEP, he was a friend, philosopher and guide in true sense. Ever since ICPEP-5 Conference in 2002, he regularly attended all ICPEP Conferences and took keen interest in guiding their deliberations and publication of their proceedings. His deep interest in ISEB/ICPEP can be gauged from the fact that less than on a month before his death, he had informed about his illness, "cancer survivor", while expressing his desire to visit India even on a wheel chair to attend ICPEP-5 Conference in December 2014. Professor Sagar V. Krupa, Emeritus and Research Scientist, age 71, died on May 12, 2014, survived by his wife of 46 years, Nancy. Sagar graduated from HS and college in his native India. He studied at the University of Wisconsin, Madison, and earned his Ph.D. at the University of Uppsala, Sweden, where he continued to work and later earned there highest degree of Doctor. He taught and did research at the University of Minnesota for 35 years and was appointed Professor Emeritus in 2009 after which he continued his work as a private consultant. His research was directed to coupling air pollution and climate change to food production and conserving natural resources. He taught many summer in Mexico at the post graduate agricultural colleges, arranged by Professor Maria de Lourdes de la Isla de Bauer (who also attended ICPEP-2 at CSIR-NBRI, Lucknow in 2002) and Professor Santiago Sanchez Preciado. Sagar published some 150 scientific articles and 11 books and was the chief editor of the Elsevier book series "Developments in Environmental Science," and was one of the editors of the electronic journal "The Scientific World." He acted as chair & science advisor to the Alberta, Canada government industry acid deposition research program, the science committee of the German Parliament and the USDA National Agricultural Air Quality Task Force. Sagar had a passion for science that was truly incredible. He was internationally recognized as a brilliant scientist with a mind that never stopped. He traveled all over the world and challenged everyone all of the time. There was never a boring moment when Sagar had the floor at an international conference while making a point or delivering a talk. While his comments and observations were razor sharp, there was always a twinkle in his eye and a chuckle in his voice. As a teacher and educator he had a love for students and always encouraged everyone to get "off their butts" and make a difference. He is remembered for his bigger than life personality, his probing scientific mind, his incredible memory and for many acts of kindness, especially in helping others achieve their educational goals. Prof Krupa has left behind a large number of friends in India, especially those in ISEB family who will deeply miss him. May his soil rest in peace.

ENVIRONNEWS, July 2014



**ENVIRONEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
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LUCKNOW (INDIA) VOL 20 No 4 October, 2014

<b>IN THIS ISSUE</b>	<b>IMPORTANT NOTICE</b> ICPEP-5 RESCHEDULED
Letters.....02	Due to some technical reasons, Organizing Committee of ICPEP-5 has decided to reschedule Fifth International Conference on Plants & Environmental Pollution to February 24-27, 2015. Consequently, the following extended deadlines will henceforth be applicable: <b>Submission of abstracts: 15 December 2014</b> <b>Submission of Registration forms (with concessional fee): 15 December 2014</b> <b>Registration (with normal fee) permitted with prior intimation, at the Reception Desk: 23-24 February 2015</b> Inconvenience caused to delegates is deeply regretted. Detailed information can be accessed from our website: <a href="http://isebindia.com">http://isebindia.com</a> Kindly drop in a line to confirm that you will attend this conference as per revised schedule. In that case the Registration form, the registration fee (if paid) and the Abstract submitted by you will remain valid and you will not have to submit them again. Registration forms and Abstracts already submitted by the delegates will remain valid for the rescheduled conference.
News Flash.....03	<b>INFORMATION REQUIRED FROM FOREIGN DELEGATES</b> As per Government of India guidelines, we have to obtain clearance from Government for holding an international conference which involves the participation of foreign delegates. For seeking this clearance, we are required to provide some basic information about foreign delegates. You are, therefore, requested to provide the following information to us by e-mail at the earliest. (1) Name of Participant, (2) Father's/husband's Name, (3) Nationality, (4) Date of Birth, (5) Place of Birth, (6) Passport Number, (7) Date & Place of issue of Passport, (8) Date of Expiry of Passport, (9) Full Mailing Address, (10) Brief background of the delegate relating to participation in the event (abstract or paper presentation). This will facilitate your participation and processing of visa requirements expeditiously.
Economic development and saving environment.....04	<b>Organizing Secretariat ICPEP-5</b> CSIR-National Botanical Research Institute, Lucknow 226001, India Email: <a href="mailto:lucknow@icgpn.org">lucknow@icgpn.org</a> , Tel: +91-522-2297821
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**ENVIRONEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
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LUCKNOW (INDIA) VOL 21 No 1 January, 2015

<b>IN THIS ISSUE</b>	<b>President ISEB's New Year Message</b>
Letters.....02	<b>E</b> nvironews is the quarterly newsletter of International Society of Environmental Botanists (ISEB), which was founded at CSIR-NBRI, on 3rd December 1994. Less than a month after its founding, ISEB launched Environews to disseminate latest scientific information on Environment and Plant Sciences to a wide spectrum of people which included not only researchers and academicians but also non-specialist readers who had a general interest in plants and environment, though they may not follow the complicated scientific data which appeared in specialized scientific journals. The current issue is the 81st issue of Environews, which enjoys a world-wide circulation through its print and electronic editions. ISEB has made commendable progress and won many laurels and international acclaim during the past 20 years which, I need not to repeat here, as it is available on our website: <a href="http://isebindia.com">http://isebindia.com</a> , which has received over 56000 hits from all corners of the world. After organizing four well attended International Conferences in 1996, 2002, 2005 and 2010, we are set to organize Fifth International Conference on Plants & Environment Pollution (ICPEP-5) during 24-27 February 2015, at CSIR-NBRI, Lucknow. As Director of CSIR-NBRI and President of ISEB, it is my proud privilege to invite you to this broad-based multi-disciplinary Conference. I also seek your help and co-operation in making this Conference even more successful than the earlier ones organized by us. I offer my greetings and good wishes to all members of ISEB and readers of Environews for the New Year 2015. Looking forward to your continued support and patronage to ISEB and Environews as well as to CSIR-NBRI, which is the fountain head of many R&D and societal activities organized for the welfare of common man around the globe, without any consideration of geographical boundaries. <b>Dr. Chandra Shekhar Nautiyal</b> President ISEB & Director, CSIR-NBRI, Lucknow, India
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**Happy New Year 2015**  
President and Members of the Executive of International Society of Environmental Botanists Wish a Very Happy, Fruitful and Prosperous New Year to all Members of ISEB and readers of ENVIRONEWS  
With this issue  
Environews enters the Twenty-one year of its publication

ENVIRONEWS, January 2015

**2. World Environment Day:** World Environment Day was celebrated on 5<sup>th</sup> June 2014.

**3. Foundation Day:** Foundation day of ISEB was celebrated on 3<sup>rd</sup> December 2014.

**4. Fifth International Conference on Plant and Environment (ICPEP-5) (24-27 February, 2015)**

Over the years, environmental pollution has become a major problem for a number of reasons. The growth of human population and industrialization has led to resource competition among humans over land use change, deforestation or over harvesting, expansion of urbanization, which causes a negative impact on biodiversity of different habitats, forest cover, forest growth and ecosystem services. Additionally, the continuous rise in temperature, a sharp increase in harmful gases, sea level rise, stress of nutrient and water availability may increase the negative impacts on different processes in earth and human systems. To discuss these and many other environmental issues at an international forum necessitated for organization of Fifth International Conference on Plants and Environmental Pollution (ICPEP-5) during 24<sup>th</sup> to 27<sup>th</sup> February 2015. The conference was jointly organized by International Society of Botanists (ISEB) and CSIR-National Botanical Research Institute, Lucknow, India.



The conference was formally inaugurated on 24<sup>th</sup> February, 2015 by the Chief Guest, Prof. Y.S. Rajan, Honorary Distinguished Professor, Indian Space Research Organization, Bengaluru, India in the presence of over 500 delegates from India, USA, Poland, Sweden Czech Republic, Egypt, Pakistan, Bangladesh & U.A.E. Prof. Rajan in his inaugural address, shared with the audience, latest information on various fields of science like space-based earth observations, natural and herbal products, soil biology, invasion biology, biodiversity, farming and deforestation etc. and discussed the need for collaborative approach and intensifying the research in various areas. Dr. C. S. Nautiyal, Director CSIR-NBRI & CSIR-IITR and President ISEB, presided over the function and welcomed the guests and delegates. On this occasion, Prof. V. S. Ramamurthy, former secretary DST, the Guest of Honour, in his brief address conveyed his blessings to ISEB and ICPEP-5. He emphasized the need to extend scientific information to common people for the development of the country. Dr. K. J. Ahmad, Secretary ISEB and organizing Secretary ICPEP-5 explained the genesis of ISEB and the purpose of holding ICPEP-5.



Before the formal deliberations, the delegates observed two minutes' silence to pay homage to two distinguished officials of ISEB/ICPEP namely, Dr Prakash Chandra (India) and Prof. Sagar Kurpa (U.S.A), who passed away after the last conference.

Scientific sessions followed the inaugural function. The conference program addressed the pressing problems of environmental stresses and the role of plants in combating them. The other important environmental issues deliberated upon included global climate change, freshwater problem, dwindling forests, biodiversity losses, emergent ecological disturbances on plants, environmental issues and other factors in environmental plant relation.



The deliberations during the conference revolved around the ten themes:

1. Climate Change
2. Environmental Biotechnology
3. Plant Microbe Interaction
4. Contemporary Environmental Issues
5. Plant Response to Environmental stress
6. Bioindication and Bioremediation
7. Environment and Biodiversity
8. Energy Biofuel
9. Environmental Impact Assessment
10. Eco-education



One special session devoted to Prof. H.S. Srivastava Foundation for Science and Society was also organized and Prof. Hendrik Kupper, Biology Center of the Czeck Academy of Sciences, delivered the Prof. H. S. Srivastava Memorial lecture. A special talk was delivered by Prof. Geeta Gandhi Kingdon, President and Coordinator,

City Montessori School, Lucknow, India was delivered on “Illustration from a School Environment Project” highlighting the School Environment project and discussed how scientists can help in environmental awareness and technological changes.

The keynote lectures were given by leading researcher in relevant fields. In Climate Change session, Prof. V.R. Reddy, USDA-Agriculture Research Service, USA, deliberated on “Climate Change and Global Food Security: Challenges and Opportunities”. The presentation outlined some examples of the development and use of the crop productivity and to mitigate the harmful effects of adverse environmental variables on natural resources, both in the current and in the future changing environmental ecenario. In another keynote presentation Prof. Om Prakash Dhankher, Department of Plant, Soil and Insect Sciences, University of Massachusetts, USA discussed how engineered plants can be used for detoxification and phytoremediation of arsenic and production of Biofuels and Bioproducts on contaminated sites. Dr. Dipanker Chakraborti, Director (Research) School of Environmental Studies – Jadavpur University, India, through his keynote talk highlighted the widespread risk of arsenic and fluoride on health, socio-economic implications and mitigation strategies for safe water availability. Prof C.R. Bhatia former Secretary, Department of biotechnology spoke about the sustainable crop production with increasing population and diminishing natural resources. He emphasized on sustainable agriculture. In his keynote talk Prof. C.K. Varshney, School of Environmental Sciences, JNU and Distinguished Adjunct Professor, Asian Institute of Technology, Bangkok, focused on food security to feed 9.5 billion humans in 2050, which included declining land availability, soil erosion, CO<sub>2</sub> emission, climate change etc. He also focused on topospheric ozone and its impact on plants. Mr, Mahendra Modi, ADG, SIT U.P., Lucknow, India deliberated on the innovative methods for Rain Water Harvesting and models for water conservation, recharging and development.

The session on Climate Change” dealt with the impact of climate change on biodiversity shift and extinction. The focus was on raising CO<sub>2</sub> concentration and its impact on growth and yield of crops and forests and the assessment through geospatial modeling.

The lectures in the session “Environmental Biotechnology” dealt with the biotechnological approaches to combat environmental stresses which included heavy metal, salt, biotic biopolymer, etc.

The third session was “Plant Microbe Interaction” emphasizing the role of microbes in reducing stress (both biotic and abiotic) induced in crops. Researchers was also discussed on the microbial contribution to carbon sequestration.



The fourth session was devoted to the “Contemporary Environmental Issues” where matters related to development of eco-friendly technologies, sustainable agriculture, biopesticides, ecosystem services etc. were discussed.

The session of “Plant Response to Environmental Stress” focused on the interaction of different pollutants with the plant system. The session of “Bioindication and Bioremediation” dealt with the importance of Bioremediation and role of different plants in reducing the contamination from water and soil. The importance of the biomonitoring of pollutants by plants like algae, lichen, mosses, microflora, ferns, water plants etc was also emphasized by several speaks. In the seventh session, the lectures were focused on “Environment and Biodiversity”. There was mention on biodiversity scenario, conservation management and Environmental sustainability. Emphasis was also on role of ecosystems in protecting environment.

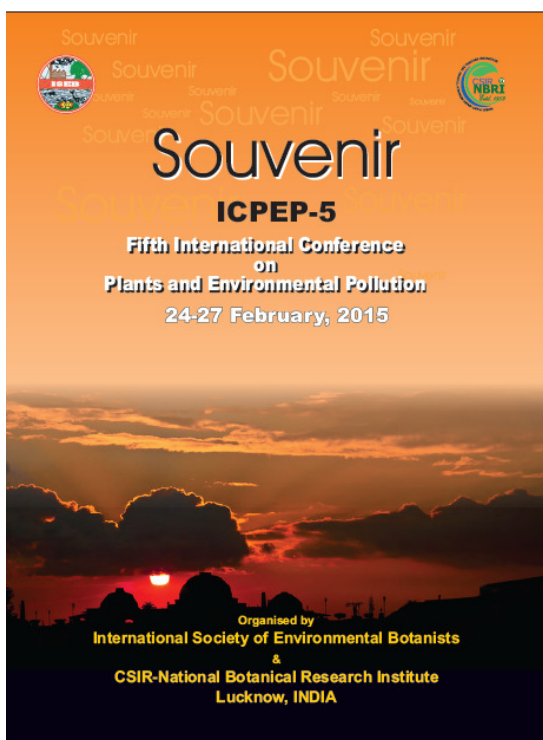
A session was also devoted to “Energy Biofuel” being an important talk of the day. Discussion was on the biofuels – impact on ecosystem services, biodiversity and human well-being. The ninth session dealt with the assessment of environmental impact on natural resources. Various models were presented which can be used for predicting and mitigating pollutants.



The talks on “Eco-education session took the audience to the new dimension in environmental sciences like Green Computing, Microbial Forensics, Environmental Information system, etc.

There was an enthusiastic participation of delegates in presenting their research findings through the posters. The posters were evaluated and twelve posters were awarded prizes for new concept and good presentation.





The Valedictory Session was organized after the Scientific Sessions on the afternoon of 27<sup>th</sup> February, 2015 which was chaired by Dr. P.V. Sane, former Director of CSIR-NBRI and founder president of ISEB, Wherein, some distinguished delegates from different countries expressed their views about the outcome of the Conference. In the end Conference recommendations were presented and inputs were taken from the delegates.

#### **ICPEP-5 RECOMMENDATIONS:**

1. There is a need to focus our attention to geopolitical issues of the environmental concern especially Climate Change and Water Management
2. Develop and evaluate the comparative success of various cost-effective pollution mitigation strategies suited to and accepted by local community.
3. Initiate studies on ecosystem services, apparent today and in future and assess their broad tangible and intangible benefits so that the people and concerned authorities may become better convinced to conserve ecosystems.
4. Initiate ways to develop Global networking and linkages among botanical researchers in different countries to address common environmental issues.
5. Systematic studies need to be initiated on Plant Biodiversity as bulwark against environmental pollution and climate change.
6. Monitoring the spread of invasive alien plants and analysis of their impact on local biodiversity and ecosystem process.

7. To develop a strong mechanism to promote environmental education and awareness among young people and environmental literacy among the public through outreach.
8. Identification of suitable microbes and crop varieties for abiotic (including climate change) and biotic threat for enhanced productivity.
9. Strategic use of plant species for pollution abatement and for biofuel production.
10. There is a need to capture the benefits of “traditional knowledge” in plant research applying scientifically sound methodologies.
11. Organize “Sixth International Conference on Plant and Environmental Pollution ICPEP-6” during next 4-5 years to exchange information on the progress of work, based on the aforementioned recommendations.



# ACTIVITY REPORT

1<sup>st</sup> April 2015 to 31<sup>st</sup> March 2016

**International Society of Environmental Botanists  
CSIR-National Botanical Research Institute  
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**ENVIRONNEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
*Newsletter*

LUCKNOW (INDIA) VOL. 21, No. 2 April, 2015

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**Message from Director General, CSIR for ICPEP-5**

It gives me immense pleasure to learn that CSIR-National Botanical Research Institute (CSIR-NBRI), Lucknow and International Society of Environmental Botanists (ISEB) based at CSIR-NBRI are jointly organizing the Fifth International Conference on Plants and Environmental Pollution (ICPEP-5) during February 24-27, 2015 at CSIR-NBRI Campus, Lucknow, India.

One of the major problems faced by mankind today, the 'environmental pollution' has grown to alarming levels in the past few years. In the last century, the fast pace of industrialization, increasing demand for food, shelter and energy and over exploitation of natural resources, were mainly responsible for creating the problem of environmental pollution in developed countries. It's time now that this problem is addressed in right earnest and in an inclusive manner. Also, an enabling framework needs to be put in place for the same.

Vegetation plays an important role in cleansing the environment. These are research based evidences about the same. Further, deciduous plants are found to absorb about a third more of a common class of air-polluting chemicals than previously thought of. Thus plants have a very vital role in cleansing the environment. They being the natural resource could be judiciously utilized to address the pollution related problems faced by our ecosystem.

I hope that ICPEP-5 will provide an interactive platform for the in-depth deliberations on the burning problems of environmental pollution and the role of plants for its amelioration. This would be leading to learning as well from each other's experience.

I wish the ICPEP-5 a grand success and congratulate all the members of CSIR-NBRI and ISEB family for this extremely relevant and timely initiative.

New Delhi  
February 25, 2015

*(M.O. Garg)*

ENVIRONNEWS, April 2015

**ENVIRONNEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
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LUCKNOW (INDIA) VOL. 21, No. 3 July, 2015

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**The Trembling Himalayas**

It took 6.5 million years ago, that the Indian Plate floating on the Tethys Sea like a Noah's Ark travelled eastward from the southern hemisphere and 'clashed' with the Eurasian Plate. This docking was something akin to the docking of the two space ships that with a difference that the oceans generated in the womb of the earth were so much that they gave rise to the land, yet youngest mountains of the world - the Himalayas.

Since then, the Indian Plate continues to move under the Eurasian Plate, causing stress along the plate margin. Despite scientific and technological achievements in all fields, man is almost in front of nature's wrath. During the recent earthquake in Nepal on 25<sup>th</sup> April, 2015 more than 1000 people have died and the sheer magnitude of the death toll has shown the helplessness of the mankind. It may be mentioned here that the seismologists had warned of a massive earthquake in 2013, but the earthquake science is still in the infancy and it is not yet possible to predict a time frame of the impending earthquake.

The last major earthquake (magnitude 8.4) occurred in 1934, killing an estimated 17,000 or more both in Nepal and India. The Earth Science goes to the domain, present is a key to the past and the past is a window for the future. Nepal has been shaken violently in the past too, in 1225, 1344, 1833, 1864 and 1934 and now. It is high time to take lessons from the past earthquakes.

Politically, we may be different countries, but for the Nature it is the same land. Thus, if Nepal is needed the adjacent Ganga plains of Uttar Pradesh and Bihar and of course Delhi become vulnerable. Compared to Nepal, the region lying within Indian Territory is densely populated. The pressure of the population has been so much that now there is a change of land and there is a need for high rise buildings. In Delhi, Lucknow, Patna etc. the skyline is now completely changed. The secret tremors around the people and brought them out of their houses and offices with lines of fear clearly discernible on their faces.

The seismologists like Roger Bilham and Padma Shrestha Prof. K.S. Vaidya have been writing in various scientific journals about the possibility of a Great Earthquake in Central Karakoram, Nepal and/or Sikkim, Nepal but its share of trembles. If we go by their model Central Karakoram in Uttar Pradesh and Sikkim in the Northeast should brace up for a violent shaking. But a million dollar question is, do these plains have earthquake resistant houses/schools/hospitals? Are their roads and bridges (Highways, earthquake resistant) if a serious survey is taken the answer will be No. It is high time to implement building codes to tolerate earthquake of 7 and above magnitude. It is also high time to retrofit all other vulnerable structures, where people gather en-masse.

After engineering the recent Nepal Earthquake, one can say with confidence that earthquake resistant building codes need to be strictly implemented in large cities like Delhi, Noida, and Lucknow. Laxty on the part of the Government and the members of the society could be catastrophe.

V.K. Joshi  
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ENVIRONNEWS, July 2015



**ENVIRONEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
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**ENVIRONEWS**  
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LUCKNOW (INDIA) VOL. 22, No. 1 January, 2016

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**Dr. Girish Sahni – New DG CSIR**

**D**r. Girish Sahni, a renowned Indian Scientist and Director of CSIR-Institute of Microbial Technology, Chandigarh has been appointed Director General of the Council of Scientific and Industrial Research (CSIR), which is a premier research and development organization of India.

Born on 2nd March 1956, Dr. Sahni is a PhD from Indian Institute of Science (IISc), Bangalore. His post PhD career included a stint each in University of California, Santa Barbara, CA, USA, Postdoc Trainee 1984-86; Rockefeller University New York, USA, Sr. Research Associate and Adjunct Faculty 1986-88; and Albert Einstein College of Medicine, New York, Sr. Research Associate 1987-91, before he joined CSIR-IMTECH in 1991. He became Director of the Institute in 2005.

Dr. Sahni, having specialization in Protein Engineering, Molecular Biology, and Biotechnology, has contributed significantly in the area of protein cardiovascular drugs especially ‘Clot Busters’ and their mode of action in the human body. The team led by him is responsible for producing technology for India’s first Indigenous Clot Buster Drug, natural streptokinase.

He is Fellow, Indian National Science Academy, New Delhi; Indian Academy of Science, Bangalore, and NASI, Allahabad; Fellow, Association of Microbiologists of India; and Member, Gaha Research Foundation.

Amongst many awards he has received for his contributions, the most important ones are: National Biotechnology Product Development Award 2002; CSIR Technology Shield 2001-2002; The Varvik Industrial Award 2000; Ranbaxy Award in Pharmaceutical Sciences 2003; Vigyan Rattan Award 2014; Shri Om Prakash Bhasin Award 2013; and CSIR Technology Award for Business Development and Technology-Marketing 2014.

**Dr. Sahni is a Patron Member of International Society of Environmental Botanists, Lucknow (ISEB).**

Members of ISEB are requested to immediately intimate any change in their contact address including postal, email, fax, and telephone to ISEB office. All correspondence should be addressed to: The Secretary, International Society of Environmental Botanists, CSIR-National Botanical Research Institute, Rana Pratap Marg, Lucknow 226001, India. Tel: +91-522-2299321. E-mail: iseb@iseb.org or isebmail@gmail.com; Website: <http://iseb.in>

ENVIRONEWS, October 2015 1

**IN THIS ISSUE**

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**President ISEB's New Year Message**

**E**nvironews is the quarterly newsletter of CSIR-NBRI-based International Society of Environmental Botanists (ISEB). Founded on 3rd December 1994, ISEB completed 21 years of its existence only last month. Over 450 members strong ISEB has gained worldwide recognition and acclaim for its enormous contributions for the cause of environmental protection, biodiversity conservation and sustainable plant wealth utilization. From 1996 to 2015 ISEB has organized five International Conferences on Plants and Environmental Pollution (ICPEP) in collaboration with CSIR-NBRI. Delegates from nearly 50 countries participated in these highly successful conferences.

ISEB maintains a highly informative and educative website which has been accessed by nearly 40,000 individuals from more than 140 countries across the globe. ISEB is publishing this quarterly newsletter (Environews) since January 1995 with an aim to bring latest and complex scientific information on plants and environmental sciences to the reach of specialists and non-specialists, in a simple and non-complicated language, from different parts of the world. The present issue is the 85th issue of Environews which is being published without a single interruption.

CSIR-NBRI rededicates itself to provide all moral and material support and encouragement to ISEB and Environews in promoting the cause of environmental protection, biodiversity conservation and sustainable plant wealth utilization and in facing the onslaught of climate change. I am happy to note that ISEB is also doing some useful work for CSIR-NBRI by informing interested individuals about the researches carried out by our scientists through its newsletter, conferences and website.

On behalf of ISEB and, on my own behalf, I wish to extend my warmest greetings and best wishes to all members of ISEB and readers of Environews for the New Year 2016.

**Dr. Chandra Shekhar Nautilwal**  
President ISEB & Director  
CSIR-NBRI, Lucknow, India

**HAPPY NEW YEAR 2016**  
President and Members of the Executive of International Society of Environmental Botanists Wish a Very Happy, Fruitful and Prosperous New Year to all Members of ISEB and readers of Environews.  
With this issue, Environews enters the 22nd year of its publication

ENVIRONEWS, January 2016 1

**2. International Journal of Plant and Environment:** A biannual international journal was published by the society during the period.

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**International Journal of Plant and Environment**

Vol. 1, No. 1, August 2015




"International Society of Environmental Botanists"  
Lucknow, India

MRI Publication Pvt. Ltd. (OPC)

**3. World Environment Day:** World Environment Day was celebrated on 5<sup>th</sup> June 2015.

**4. Foundation Day:** Foundation day of ISEB was celebrated on 3<sup>rd</sup> December 2015.



## ACTIVITY REPORT

1<sup>st</sup> April 2016 to 31<sup>st</sup> March 2017

**International Society of Environmental Botanists**  
**CSIR-National Botanical Research Institute**  
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**Tel: +91-522-2297821; Fax: +91-2205836/2205839**  
**Email: [isebnbrilko@gmail.com](mailto:isebnbrilko@gmail.com)**  
**Website: <http://www.isebindia.com>**

International Society of Environmental Botanists (ISEB) is engaged in activities related to promoting environmental protection, biodiversity conservation and sustainable use of bioresources. Under these objectives following activities were carried out during the period.

**1. Environews:** A quarterly news letter of ISEB (4 issues were published during the year).



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The carbon dioxide has elevated consecutively in the fourth year 2015

The annual growth rate of atmospheric carbon dioxide (CO<sub>2</sub>) jumped by 3.05 parts per million (ppm) during 2015, the largest year-on-year increase in 56 years, according to US scientists. In another first, 2015 was the fourth consecutive year that CO<sub>2</sub> grew more than 2 ppm, according to researchers from US National Oceanic and Atmospheric Administration (NOAA). Carbon dioxide levels are increasing faster than they have in hundreds of thousands of years. It is explosive compared to natural processes.

In February 2016, the average global atmospheric CO<sub>2</sub> level stood at 402.59 ppm. Prior to 1800, atmospheric CO<sub>2</sub> averaged about 280 ppm.

The last time the Earth experienced such a sustained CO<sub>2</sub> increase was between 11,000 and 17,000 years ago, when CO<sub>2</sub> levels increased by 80 ppm. Today's rate of increase is 200 times faster.

The big jump in CO<sub>2</sub> is partially due to the current El Nino weather pattern, as forests, plant life and other terrestrial systems responded to changes in weather, precipitation and drought.

The largest previous increase occurred in 1998, also a strong El Nino year. Continued high emissions from fossil fuel consumption are driving the underlying growth rate over the past several years.

"Sometimes the right path is not the easiest one," is very true. It is easy to be wasteful and careless, but if we want to keep a livable environment for future generations, we must conserve and preserve. We only have one planet to let's take care of it.

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Pineapples could play key role in global superbug battle

Pineapples are the latest and strangest weapon to emerge in the global battle against superbugs which are predicted to kill up to 10 million people a year by 2050. Australian scientists have discovered that a collection of enzymes found in the stems and roots of the tropical fruit can cure diarrhoea in piglets, reducing the reliance on antibiotics. Enzymes found in pineapple stems and roots could prove key to developing alternatives to antibiotics. Being able to treat farmed piglets with a natural remedy for diarrhoea also takes antibiotics out of the human food chain.

La Trobe University biochemist Rob Pike said the collection of enzymes found to treat diarrhoea in piglets would likely provide an alternative treatment for the condition in humans as well, given the similarities in physiology and anatomy between the two species.

Indiscriminate use of antibiotics has resulted in resistant bacteria and this contributes to the rise of superbugs. Multi-drug resistant bacteria, known as superbugs, are predicted to kill more people than cancer if left unchecked—about 10 million people a year by 2050. About 500 superbug cases are detected in Australia each year. Developing a natural alternative to treating diarrhoea in humans would significantly add to scientists' arsenal when tackling the global superbug problem. Unlike antibiotics which target the bacteria, the three enzymes found in the pineapples work with the cells in the pig's gut, making it difficult for the bacteria to attach to the cells. This means diarrhoea doesn't take hold.

This is a whole new way of going about the treatment of diarrhoea. It means that the pig cells are no longer vulnerable to bacteria. Pig farmers rely heavily on antibiotics to treat scour, pre-weaning diarrhoea in piglets. Scour is a common cause of death in piglets, which costs the Australian pig industry more than \$7 million a year.

Targeting the gut cells is key because it denies the bacteria the chance to evolve and become resistant. It is resistance which researchers and health professionals fear could eventually render antibiotics useless. The three enzymes found in the pineapple stem and root are called bromelain, a collection of enzymes which were discovered in the 1930s. However it was only 30 years ago that their antibiotic qualities were discovered. The momentum to develop alternatives to antibiotics is there now because people believe antibiotics are on the way out and we need something to replace them.

Source : Sunday Morning Herald

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**NEW DIRECTOR OF NBRI AND PRESIDENT ISEB**

Dr. S. K. Banik Professor and Head, Department of Botany, Centre for Advanced Studies in Botany, North Eastern Hill University, Shillong (NEHU) has joined as Director, CSIR-National Botanical Research Institute, Lucknow. Being Director of the Institute, he would also be the President of International Society of Environmental Botanists (ISEB). He is an eminent ecologist with twenty eight years of research experience in the field of Plant ecology and Natural Resources management. He has been leading a strong group of researchers at NEHU pursuing frontier research in diverse areas such as plant diversity including inventory, biogeography, and conservation of threatened species, ecological modeling, population and molecular ecology, chemical ecology, carbon sequestration, and impact of climate change on species and ecosystems. He has been serving as Chairman/Member of several Expert Committees/Task Forces constituted by Ministry of Environment, Forests and Climate Change (MoEF&CC), Planning Commission, Department of Biotechnology (DBT), and Ministry of Science and Technology, Govt. of India. He has published eleven books and 71 research papers, many of which are in internationally reputed scientific journals with high impact factor and are cited extensively world-wide. He is Member of the Editorial Boards of *Tropical Ecology and Journal of Biodiversity*. Post-graduate students have been awarded Ph. D. degree under his supervision. He is the Coordinator of three major R & D projects of national importance funded by DBT and MoEF&CC. He is a LEAD Fellow, awarded by Leadership in Environment and Development (LEAD) International, Rockefeller Foundation, USA.



Editor, *EnviroNews*

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**PRESIDENT ISEB'S NEW YEAR MESSAGE**

Almost a decade before joining CSIR-NBRI as its Director, I had joined NBRI-based International Society of Environmental Botanists (ISEB) as its life member. Later, I was also elected as its Executive Councilor. I feel honored that on assuming the charge of Director NBRI, I was simultaneously elected as President of this prestigious Scientific Society, which has won many laurels at national and international levels during its 22 years existence.

ISEB was founded at a meeting of environmental scientists held at NBRI on 1<sup>st</sup> December 1994 to promote and highlight the role of plants in the cause of environmental protection, biodiversity conservation, bio-restoration and sustainable plant wealth utilization. From just a 28 member society it rose a 450 members strong scientific body which has spread its wings far and wide, not only in all corners of India but in many foreign countries also. In recognition of its outstanding contribution to environment and plant science, International Union of Biological Sciences (IUBS), Paris awarded its scientific membership to ISEB, which is a rare honour for any Indian scientific society.

To promote its objectives, ISEB, in collaboration with CSIR-NBRI, organized five highly successful International Conferences on Plants and Environmental Pollution (ICPEP) at NBRI during 1996, 2002, 2005, 2010 and 2015, which were attended by a large number of delegates from over 50 countries of the world. ISEB is publishing a quarterly newsletter *EnviroNews* since January, 1995 and the current issue (January, 2017) is the 87<sup>th</sup> issue of this highly popular newsletter which has wide reach on circulation through print and electronic editions. ISEB maintains a highly informative and educative website (<http://www.iseb.in>) which has been accessed by over 70,000 individuals from more than 150 countries.

During all these years, apart from its academic activities of highest standard, ISEB also organized a large number of outreach programmes like popular and scientific lectures, training programmes, art and painting competitions etc. for school children, both in rural and urban areas.

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**HAPPY NEW YEAR 2017**  
President and Members of the Executive of International Society of Environmental Botanists  
With a Very Happy, Fruitful and Prosperous New Year to all Members of ISEB and readers of *EnviroNews*  
With this issue, *EnviroNews* enters the 23rd year of its publication

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Lucknow, India

**3. World Environment Day:** World Environment Day was celebrated on 5<sup>th</sup> June 2016.

**4. Foundation Day:** Foundation day of ISEB was celebrated on 22<sup>nd</sup> December 2016.





## ACTIVITY REPORT

**1<sup>st</sup> April 2017 to 31<sup>st</sup> March 2018**

**International Society of Environmental Botanists  
CSIR-National Botanical Research Institute  
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INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
*Newsletter*

LUCKNOW (INDIA) VOL. 23, No. 2 April, 2017

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**CAR-FREE CITIES: HEALTHIER CITIZENS**

Private motor cars are an important part of urban transport in cities. Private diesel and gasoline vehicles contribute significantly to a city's air pollution (e.g. particulate matter, such as PM<sub>2.5</sub>), greenhouse gas emissions (e.g. carbon dioxide (CO<sub>2</sub>) and black carbon), noise pollution and raised urban temperatures and motor vehicle crashes. All of these things can raise the risk of early death and increased incidence of disease.

Furthermore, road and parking infrastructure contributes to soil sealing and takes up space that could be used to create green areas as well as pedestrian and cycling infrastructure, which are beneficial for people's mental and physical well-being. Some recent studies have focused on the link between car-free initiatives in cities and urban design and planning, city transport and planning, environmental impacts, health effects and socio-economic concerns.

In Europe, for example, primarily driven by the need to reduce greenhouse gas emissions, Oslo will invest in new bike ways, levy congestion charges during rush hours, limit parking spaces and ban all private cars from the city centre by 2019. By 2034, Hamburg plans to ban cars from a number of city roads, which will become pedestrian and bike zones. A green network, linking parks and other open spaces and covering 40% of the city is also being developed. Madrid also plans to pedestrianise the city centre with a view to making it car free by 2020. Germany recently decided to call for a ban on selling all new combustion-engine cars from 2030.

A review of 28 health impact studies related to greater active transport and less car use found people who switched from using a car to active transport received substantial health benefits from increased physical activity. This benefit will outweigh any risk cyclists or pedestrians might experience from exposure to air pollution or being involved in motor vehicle crashes. To ensure that cities are designed around people, rather than vehicles, the researchers say new urban and transport projects should focus on environmental and health priorities, rather than on enabling private-vehicle use.

Numerous studies have linked traffic-related air pollution exposure to early deaths, as well as to lung cancer and cardiovascular diseases, diabetes and obesity. Children are particularly vulnerable to the effects of traffic-related air pollution. The researchers say public health will improve as car-free cities reduce air pollution. A report has shown that levels of nitrogen dioxide (a major air pollutant) fell by 40% in Paris, France and by 20% in Leeds, UK, when cars were banned for one day.

Fewer private cars in cities will mean that traffic noise will also be reduced. One report on the Brussels' environment revealed that noise levels fell more than 10

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**SIXTH INTERNATIONAL CONFERENCE ON PLANTS & ENVIRONMENTAL POLLUTION (ICPEP-6)**

(Pre-registration open. Detailed information available on our website)

**Prof. S.K. Barik, Director, CSIR-NBRI & President ISEB**  
**Dr. K.J. Ahmad, Secretary ISEB**

(Jointly organized by International Society of Environmental Botanists (ISEB) & CSIR-National Botanical Research Institute (CSIR-NBRI), Lucknow, INDIA)

27-30 November 2018,  
Venue: CSIR-National Botanical Research Institute,  
Lucknow-226001, INDIA

Organizing Secretaries

**Dr. R.D. Tripathi** (Emeritus Scientist CSIR) Additional Secretary, ISEB  
**Dr. Nandita Singh** (Consultant Scientist CSIR-NBRI) Joint Secretary, ISEB  
**Dr. Vivek Pandey** (Senior Principal Scientist CSIR-NBRI) Joint Secretary, ISEB

Website of the Conference: <http://isebindia.com>  
Mailing address: Organizing Secretaries, ICPEP-6,  
CSIR-National Botanical Research Institute,  
Rana Pratap Marg, Lucknow-226001, India  
Phone: + 91-522-2297821/2297825/2297929/2297931;  
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E-mail ID/online submission: [icpep6@gmail.com](mailto:icpep6@gmail.com)

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**ENVIRONNEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
*Newsletter*

LUCKNOW (INDIA) VOL. 23, No. 4 October, 2017

<b>IN THIS ISSUE</b>	<p>Sixth International Conference on Plants &amp; Environmental Pollution (ICPEP-6) Jointly organized by International Society of Environmental Botanists (ISEB) &amp; CSIR-National Botanical Research Institute (CSIR-NBRI), Lucknow, INDIA 27-30 November, 2018</p> <p>Prof. Girish Sahni, Chief Patron (Director General, CSIR, New Delhi) Prof. S.K. Barik, Director, CSIR-NBRI &amp; President ISEB &amp; Chairman, Organizing Committee Dr. K.J. Ahmed, Secretary ISEB</p> <p><b>International Advisory Committee (ICPEP-6)</b></p> <table border="0"> <tr> <td>Prof. Vinay P. Anjaia (USA)</td> <td>Prof. Dr. Bernd Markert (GERMANY)</td> </tr> <tr> <td>Prof. Kamal J. Sana (USA)</td> <td>Prof. Elina Oksanen (FINLAND)</td> </tr> <tr> <td>Prof. U.K.S. Bell (UK)</td> <td>Prof. Mouni Ouzil (TUNISIA)</td> </tr> <tr> <td>Prof. Hans Bini (DENMARK)</td> <td>Dr. Maria Luisa Pignera (ARGENTINA)</td> </tr> <tr> <td>Dr. Stanislav Cizik (ITALY)</td> <td>Dr. M. Leila Radhouane (TUNISIA)</td> </tr> <tr> <td>Dr. Li. Ceyhan (SPAIN)</td> <td>Prof. V.K. Reddy (USA)</td> </tr> <tr> <td>Prof. Richard E.E. Ozang (USA)</td> <td>Prof. K. Raja Reddy (USA)</td> </tr> <tr> <td>Dr. Cem Parlakhan Shanhvir (USA)</td> <td>Prof. Riikka Rissanen (DENMARK)</td> </tr> <tr> <td>Prof. Alok Dhanan (INDIA)</td> <td>Dr. Irina Mikhaylina Safonova (RUSSIA)</td> </tr> <tr> <td>Prof. Nicholas M. Dickinson (NEW ZEALAND)</td> <td>Dr. Sonndi Saha (GERMANY)</td> </tr> <tr> <td>Prof. David A. Granite (USA)</td> <td>Prof. Shivendra Saha (USA)</td> </tr> <tr> <td>Prof. Margaret Greenway (AUSTRALIA)</td> <td>Prof. Paula Helena Nascimento Saldina (BRAZIL)</td> </tr> <tr> <td>Prof. Erwin Groll (GERMANY)</td> <td>Prof. Maria José Silva (SPAIN)</td> </tr> <tr> <td>Prof. Jennifer Ann Warlicks (MALAYSIA)</td> <td>Prof. Wajdy Swahel (EGYPT)</td> </tr> <tr> <td>Prof. Mirza Hameezuzzaman (BANGLADESH)</td> <td>Prof. Dr. Katarzyna Stralio (POLAND)</td> </tr> <tr> <td>Prof. Tanishi Suda (JAPAN)</td> <td>Dr. Rajiv K. Tripathi (INDIA)</td> </tr> <tr> <td>Prof. R.K. Kothri (INDIA)</td> <td></td> </tr> <tr> <td>Dr. Alan H. Legge (CANADA)</td> <td></td> </tr> </table> <p><b>Organizing Secretaries ICPEP-6</b></p> <table border="0"> <tr> <td>Dr. R.D. Tripathi (Emeritus Scientist, CSIR) Additional Secretary, ISEB</td> <td>Dr. Hema Singh (Consultant Scientist, CSIR-NBRI) Joint Secretary, ISEB</td> <td>Dr. Urvashi Pradeep (Senior Principal Scientist, CSIR-NBRI) Joint Secretary, ISEB</td> </tr> </table> <p>All individuals interested in attending the Conference are required to pre-register themselves by submitting duly prescribed Pre-registration forms on line by mail/e-mail/ fax latest on 21 October 2017. There is no pre-registration fee. Future Conference announcement/information and Conference Registration forms etc. will be sent only to such individuals who pre-register themselves. Delegates are required to mark the area/areas of their interest in the form. Website of the Conference: <a href="http://isebindia.com">http://isebindia.com</a> Mailing address: Organizing Secretaries, ICPEP-6, CSIR-National Botanical Research Institute, Rana Pratap Marg, Lucknow-226001, India. Phone: +91-522-2297821/2297822/2297922/2297931. Fax: 91-522-2208837/2208838 E-mail ID/online submission: <a href="mailto:icpep6@gmail.com">icpep6@gmail.com</a></p>	Prof. Vinay P. Anjaia (USA)	Prof. Dr. Bernd Markert (GERMANY)	Prof. Kamal J. Sana (USA)	Prof. Elina Oksanen (FINLAND)	Prof. U.K.S. Bell (UK)	Prof. Mouni Ouzil (TUNISIA)	Prof. Hans Bini (DENMARK)	Dr. Maria Luisa Pignera (ARGENTINA)	Dr. Stanislav Cizik (ITALY)	Dr. M. Leila Radhouane (TUNISIA)	Dr. Li. Ceyhan (SPAIN)	Prof. V.K. Reddy (USA)	Prof. Richard E.E. Ozang (USA)	Prof. K. Raja Reddy (USA)	Dr. Cem Parlakhan Shanhvir (USA)	Prof. Riikka Rissanen (DENMARK)	Prof. Alok Dhanan (INDIA)	Dr. Irina Mikhaylina Safonova (RUSSIA)	Prof. Nicholas M. Dickinson (NEW ZEALAND)	Dr. Sonndi Saha (GERMANY)	Prof. David A. Granite (USA)	Prof. Shivendra Saha (USA)	Prof. Margaret Greenway (AUSTRALIA)	Prof. Paula Helena Nascimento Saldina (BRAZIL)	Prof. Erwin Groll (GERMANY)	Prof. Maria José Silva (SPAIN)	Prof. Jennifer Ann Warlicks (MALAYSIA)	Prof. Wajdy Swahel (EGYPT)	Prof. Mirza Hameezuzzaman (BANGLADESH)	Prof. Dr. Katarzyna Stralio (POLAND)	Prof. Tanishi Suda (JAPAN)	Dr. Rajiv K. Tripathi (INDIA)	Prof. R.K. Kothri (INDIA)		Dr. Alan H. Legge (CANADA)		Dr. R.D. Tripathi (Emeritus Scientist, CSIR) Additional Secretary, ISEB	Dr. Hema Singh (Consultant Scientist, CSIR-NBRI) Joint Secretary, ISEB	Dr. Urvashi Pradeep (Senior Principal Scientist, CSIR-NBRI) Joint Secretary, ISEB
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**ENVIRONNEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
*Newsletter*

LUCKNOW (INDIA) VOL. 24, No. 1 January, 2018

<b>IN THIS ISSUE</b>	<p><b>President ISEB's New Year Message</b></p> <p>International Society of Environmental Botanists (ISEB) was founded on 3<sup>rd</sup> December 1958 on the campus of CSIR-NBRI under the guidance and inspiration of Dr. P.V. Sane, who was then Director of this Institute. He was unanimously elected as its first President. Subsequent Directors of CSIR-NBRI nursed this organization over the years under their proactive guidance and support. ISEB is now a 23 years' old international organization. It has a membership of over 650 spread over different parts of India. Across the globe, we have members from Bangladesh, Canada, Germany, Sri Lanka, U.K. and U.S.A. The quality of memberships is a matter of pride for ISEB as scores of academicians, vice-chancellors, reputed professors, Directors of prestigious national laboratories, researchers, scholars and students are represented in fair number in this Society. A highly distinguished scientist of U.K., who is a former Director of Kew Botanic Gardens Sir Ghillean T. France, F.R.S., is a member of ISEB for over two decades.</p> <p>My own association with ISEB is quite old. I joined the Society as a Life Member long before I joined CSIR-NBRI as its Director.</p> <p>EnviroNews, the quarterly newsletter of ISEB was launched on 1<sup>st</sup> January 1995 and the current issue is the 93<sup>rd</sup> issue of this highly popular scientific news magazine. While hard copies are supplied to its over 450 members, its electronic version is received by more than 5,000 individuals across the globe.</p> <p>ISEB's highly popular and informative website (<a href="http://isebindia.com">http://isebindia.com</a>) has been visited by over 60,000 people, mostly in foreign countries. ISEB has launched a biannual scientific Journal - International Journal of Plant and Environment since 2015 and in a short span of 3 years it has gained international acclaim and recognition.</p> <p>The biggest feather in ISEB's cap is the organization of five International Conferences on Plants and Environmental Pollution (ICPEP-1 to ICPEP-5) in 1996, 2002, 2005, 2010 and 2015 in collaboration with CSIR-NBRI which were attended by over 175 delegates from more than 30 countries of the world. This has put ISEB on world map of plant and environmental sciences and is <i>contd.</i></p> <p style="text-align: center;"><i>Happy New Year 2018</i> President and Members of the Executive of International Society of Environmental Botanists (ISEB) With a Very Happy, Fruitful and Prosperous New Year to all Members of ISEB and readers of EnviroNews With this issue, EnviroNews enters the 24<sup>th</sup> year of its publication</p>
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Sea Level Rise and Cross Border Migrants – An Arduous Challenge	
Prof. C.K. Vanshey (India)	03
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Prof. Omkar (India)	05
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**2. International Journal of Plant and Environment (IJPE):** A biannual international journal was published by the society during the period. Volume 3, No. 1 (January 2017) and No. 2 (July 2017) have been published.

ISSN No. 2454-1117 (Print)  
ISSN No. 2455-202X (Online)

**International Journal of Plant and Environment**

Vol. 3, No. 1, January 2017



MRI Publication Pvt. Ltd. (OPC) International Society of Environmental Botanists  
Lucknow, India

ISSN No. 2454-1117 (Print)  
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UGC Journal No. 43696

**International Journal of Plant and Environment**

Vol. 3, No. 2, July 2017



MRI Publication Pvt. Ltd. (OPC) International Society of Environmental Botanists  
Lucknow, India

**3. World Environment Day:** World Environment Day was celebrated on 5<sup>th</sup> June 2017.

CSIR-NBRI, Lucknow celebrated World Environment Day on June 05, 2017 in collaboration with International Society of Environmental Botanists (ISEB), U.P. Council of Science & Technology (UP CST) and Economic Botany Information Service (ENVIS), NBRI Centre. On this occasion, Dr. Dinesh Sharma, Hon'ble Deputy Chief Minister, U.P. was the Chief Guest and Dr. P.K. Seth, Ex-Director, CSIR-IITR and Ex-CEO, Biotech Park; Lucknow was the Guest of Honour.

In his inaugural address, Prof. S.K. Barik, Director NBRI welcomed the Chief Guest, other dignitaries and a large number of students from local schools and colleges, and highlighted the history and importance of World Environment Day. Prof. S.K. Barik informed that CSIR-NBRI was continuously working for the safety of our environment. He also highlighted some of the multi-targeted programmes of CSIR-NBRI running for clean and green environment. Prof. Barik also discussed the developmental strategies of green belts along the rivers. He also informed about the recently developed low arsenic rice variety by NBRI scientists and suggested for its large scale uses in Uttar Pradesh. He also sought help and support from State Government for floriculture industry set up and herbal medical research.

Dr. Pankaj Kumar Srivastava, Senior Scientist informed about ENVIS-NBRI Centre supported by the Ministry of Environment & Forests, Govt. of India along with environmental conservation and awareness programmes being conducted by the ENVIS-NBRI, including newly developed android mobile application app Green Planner for citizens available at Google Play Store. He also made a reference of ISEB and its contributions since its founding in 1994. During the programme, an ENVIS-NBRI Newsletter "Indoor Air Pollution" and Environews, a quarterly publication were released by the chief guest.

Dr. P.K. Seth in his presidential address appreciated that CSIR-NBRI was working for the safety of environment for the past six decades. He emphasized that India was the only country where the environment was linked to religion. Plants and rivers were worshiped in India for ages. He underscored the importance of organizing awareness programmes for clean and green environment; besides need for plantation of drought resistant and medicinal plants for the protection of environment.

Chief Guest of the function, Hon'ble Deputy Chief Minister, Dr. Dinesh Sharma in his address, emphasized on better harmony between environmental conservation and human life-style. Dr. Sharma said that our ancestors were very much aware about the importance of nature conservation and, therefore, they linked different plants and animals to various religious rituals. He called upon the audience to conserve nature and environment as a day-to-day need, not only just to celebrate as a special day. Dr. Sharma reminded about linking of each tree to each planet covering major nine planets of the universe. Dr. Sharma informed about a tree bank of 35000 trees that he initiated during his tenure as Mayor of Lucknow earlier. These trees were planted as a mission in the city with the help of students of schools, colleges, universities and Lucknow Municipal Corporation. Dr. Sharma appreciated the proactive role of institutions like NBRI in the State Government's efforts for development vis-à-vis environmental conservation through green technologies in collaboration with different state departments.

Students from major educational institutions (Saarthak Foundation, Ahsaas Organization, Integral University, Amity University, RLB, CMS schools) participated

in the open day programme at NBRI as a part of World Environment Day Programme.

The Chief Guest Dr. Dinesh Sharma planted a sapling of “Rudraksh” tree at NBRI lawn. Guest of Honour Dr. P.K. Seth also planted a sapling of 'Chandan' tree. Members of International Society of Environmental Botanists, CMS Founder Dr. Jagdish Gandhi, Prof. R.S. Tripathi were present during the programme. In the end, Dr. R.D. Tripathi, Additional Secretary of ISEB proposed vote of thanks.

**4. Foundation Day:** Foundation day of ISEB was celebrated on 22<sup>nd</sup> December 2017.



## ACTIVITY REPORT

1<sup>st</sup> April 2018 to 31<sup>st</sup> March 2019

**International Society of Environmental Botanists**  
**CSIR-National Botanical Research Institute**  
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**Website: <http://www.isebindia.com>**

International Society of Environmental Botanists (ISEB) is engaged in activities related to promoting environmental protection, biodiversity conservation and sustainable use of bioresources. Under these objectives following activities were carried out during the period.

**1. Environews:** A quarterly news letter of ISEB (4 issues were published during the year).

## ENVIRONNEWS

INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS

# Newsletter

LUCKNOW (INDIA)VOL. 24, No. 2April, 2018

IN THIS ISSUE	World Environment Day 2018: Fight against Plastic Pollution
Letters 02	<p>This year, the World Environment Day is planned to be organized all over the world with the theme 'Beat Plastic Pollution'. Plastic is a major environmental pollutant present as a micro-, meso- and macro debris. Due to their chemical nature, they are highly durable and inexpensive to produce. In last decade the plastic production has surpassed the total production reaching 335 million metric tonnes in the year 2016. China alone produces a quarter of total plastic produced in the world.</p> <p>Its production and usage has broad range i.e. packaging wrappers, biomedical devices, toys, stationary material and storage containers. Millions of tons of plastic finds its way into water reservoirs, public places and marine regions through irresponsible disposal and public littering. Its fumigation evolves harmful dioxins, volatile organic chemicals (VOCs), nitrogen oxides, sulphur dioxide, polycyclic organic matter (POM) and heavy metals. It consists of 10% of the total waste generated by humans.</p> <p>UN wants to spread awareness against plastic pollution due to its hazardous nature, affecting millions of people and environment. About one lakh living organisms die because of this environmental pollutant alone. Around 11.1 billion plastic items were found poisoning marine environment along with damage due to high temperature resulting into depletion of 50% of coral reefs (World Environment Day-Global). Therefore, the world plastic production is a potential nemesis of life on Earth.</p> <p>UN recommends government agencies, industry and municipal committees to promote Green Social Responsibility (GSR) and spread awareness to avoid littering plastic material and always try to use plastic bags and articles manufactured from biodegradable and recyclable material. Many programs are planned to be launched in India, which has the highest plastic recycling rate in the world. Thus, our Environment is our responsibility and we should take the responsibility for our sustainable future.</p>
News Flash 03	
Indian Agriculture: Tradition in Transition	
Dimple Khatri, A. Arunachalam & K. Arunachalam (India) 04	
Issues related to Sustainable Management of Forests of Northeast India	
B.K. Tiwari (India) 07	
News & Views 10	
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<b>ICPEP-6</b> <small>Registration of ICPEP-6 has been started. Please visit our website (<a href="http://www.isebindia.com">www.isebindia.com</a>) for detailed information.</small>	

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## ENVIRONNEWS

INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS

# Newsletter

LUCKNOW (INDIA)VOL. 24, No. 3July, 2018

IN THIS ISSUE	Condolence message from ISEB on the demise of Prof. Richard F.E. Crang	
Letters 02	<p>International Society of Environmental Botanists (ISEB) and CSIR-National Botanical Research Institute Lucknow, India deeply mourns the sad demise of Prof. Richard F.E. Crang (formerly Professor, University of Illinois at Urbana-Champaign, USA). Prof. Crang was the first life member of ISEB, from overseas. He readily accepted our invitation to come down to Lucknow to formally inaugurate our first International Conference on Plants and Environmental Pollution (ICPEP-1) held in 1996. During his stay here, he endeared himself to nearly 400 delegates who had come from different parts of the world. In ISEB and CSIR-NBRI he made lot of friends and admirers and earned enormous goodwill and respect by his informal and friendly behaviour. His wide knowledge, eloquence and persuasive skill impressed one and all.</p> <p>Before ISEB could launch its own website, Prof. Crang on his own, designed and launched a website for ISEB in his department and regularly asked us to provide him inputs and highlights of our activities to update it. He was very keen to visit India again and attend subsequent ICPEP conferences but consistent ill health prevented him from doing so. When ISEB's Scientific Journal, International Journal of Plant and Environment was launched, he readily agreed to contribute a research paper in the very first issue.</p> <p>ISEB conveys its deepest sympathies, to his wife Mrs. Mary Crang and bereaved family members and prays to God to grant peace to his noblesoul.</p>	
ISEB Fellowship Awards 2017 04		
Role of microorganisms in reclamation of coal-mine spoils R S Upadhyay and Richa Baghwanshi 06		
News & Views 09		
Last and Final Announcement 11		
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**ENVIRONNEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
*Newsletter*

LUCKNOW (INDIA) VOL. 24, No. 4 October, 2018

IN THIS ISSUE	ISEB FELLOWS - 2018
News Flash 2	The Executive Committee of ISEB which met on 9th October 2018 considered the recommendations of ISEB Fellowship Committee and unanimously approved the same. Prof. S.K. Barik accorded his approval to the recommendations. The award certificates will be duly presented to the awardees by the President ISEB at the inaugural function of ICPEP-6 on 27th November 2018 at CSIR-National Botanical Research Institute, Lucknow.
Assessment of ecosystem services from sacred groves of India	1. Prof. Erwin Grill Department of Botany, Technical University of Munich, Germany
SK Barik, Rashmi Rakha Gogoi, Saranya Kharbhub, Blessing R Suchiang, Ibadahun Mary Nonghaloo, D Adhikari, K Upadhaya, KC Malhotra, RS Tripathi (India) 3	2. Prof. Lena Q. Ma Soil & Water Sciences Department, University of Florida, Gainesville, Florida, USA
Strategies to reduce arsenic uptake by rice	3. Dr. Debasis Chakraborty CSIR-National Botanical Research Institute, Lucknow
Nandita Singh (India) 8	4. Prof. Kusum Arunachalam School of Environment and Natural Resources, Doon University, Dehradun
Mining and Human Health Hazards	5. Dr. Rajesh Bajpai Lichenology Laboratory, CSIR - National Botanical Research Institute, Lucknow
Babita Kumari & OP Dwevedi (India) 10	6. Dr. Sanjay Dawivedi CSIR - National Botanical Research Institute, Lucknow
Conferences 12	7. Dr. Seema Mishra DDU Gorakhpur University, Gorakhpur
Books 12	8. Prof. Shashi Bhuashan Agrawal Department of Botany, Banaras Hindu University, Varanasi
	9. Prof. Surya Kant Department of Respiratory Medicine, KGMU, Lucknow
	10. Prof. Uma Shankar North-East Hill University, Shillong, Meghalaya
	<b>ISEB Young Scientist Award</b> Dr. Amit Kumar Dept. of Botany, Lucknow University, Lucknow

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**ENVIRONNEWS**  
INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS  
*Newsletter*

LUCKNOW (INDIA) VOL. 25, No. 1 January, 2019

IN THIS ISSUE	President ISEB's New Year Message
Letters 02	The advent of New Year marks the beginning of Silver Jubilee year of International Society of Environmental Botanists (ISEB), which was established on 3rd December 1994 in a meeting of 28 scientists, held on the green and salubrious campus of CSIR-NBRI under the Chairmanship of the then Director Dr. P.V. Sane, who was elected as its first President. On taking over as Director CSIR-NBRI on November 2, 2016, I assumed the charge of President ISEB. Even before joining CSIR-NBRI, I was familiar with ISEB as a life member and have been watching its activities from close quarters. I admire the contribution of ISEB for the cause of environment, plant biodiversity and sustainable development.
News Flash 04	Soon after assuming the charge of President ISEB in 2016, the colleagues in CSIR-NBRI and ISEB planned for the organization of ICPEP-6 on a grand scale befitting the eminence and stature of CSIR-NBRI and ISEB. The ICPEP-6 was organized during 27-30 November, 2018 in which over 400 scientists including 40 scientists from 22 countries participated. I congratulate my colleagues both in CSIR-NBRI and ISEB for working day and night with extreme dedication and sincerity to make this conference a grand success.
A Report on the Sixth International Conference on Plants and Environmental Pollution (ICPEP-6) 04	I also congratulate the Fellows of ISEB elected during 2018.
Nandita Singh, R.D. Tripathi and Vivek Pandey, CSIR-NBRI, Lucknow, India	ICPEP-6 was an important milestone in the history of symbiotic relationship between CSIR-NBRI and ISEB. I am sure, many bigger milestones will be established in the coming years.
Conferences 12	
Books 12	
	<b>Prof. S.K. Barik</b> President ISEB & Director CSIR-NBRI Lucknow, India
	<i>Happy New Year 2019</i> President and Members of the Executive of International Society of Environmental Botanists (ISEB) Wish a Very Happy, Fruitful and Prosperous New Year to all Members of ISEB and readers of EnvironNews. With this issue, EnvironNews enters the 25 <sup>th</sup> year of its publication.

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**2. World Environment Day:** World Environment Day was celebrated on 5<sup>th</sup> June 2018.

**3. ISEB Fellowship Awards 2017:** International Society of Environmental Botanists (ISEB) organized First Fellowship Award function on 9th June, 2018 to award ISEB fellowship 2017 to following ISEB Life members. For this purpose, function was held at CSIR-NBRI auditorium in the presence of a distinguished gathering of scientists. Prof. S.K. Barik, President ISEB and Director CSIR-NBRI personally handed over the certificates to the awardees. On this occasion eminent Scientist Dr. Nitya Anand, former Director of CSIR-Central Drug Research Institute (CSIR-CDRI), Lucknow was the Guest of honour.

### ISEB Fellowship List (Fellows for 2017)

- |                               |   |
|-------------------------------|---|
| 1. *Dr. P.C. Abhilash         | Assistant Professor, BHU, Varanasi  |
| 2. *Prof. Madhoolika Agrawal  | Head, Botany Department, BHU Varanasi   |
| 3. Dr. K.J. Ahmad             | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 4. Dr. Nitya Anand            | Ex-Director, CSIR-CDRI, Lucknow   |
| 5. Dr. A. Arunachalam         | Indian Council of Agricultural Research, New Delhi                                |
| 6. *Prof. Arun Arya           | M.S. University, Baroda   |
| 7. *Prof. A.K. Attri          | Professor, School of Environmental Sciences, JNU, New Delhi                       |
| 8. Prof. S.K. Barik           | Director, CSIR-NBRI, Lucknow  |
| 9. Dr. H.M. Behl              | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 10. *Prof. J.N.B. Bell        | Imperial College, U.K.  |
| 11. *Dr. D.S. Bhakuni         | Ex-Scientist in Director's Grade, CDRI, Lucknow                                   |
| 12. *Prof. C.R. Bhatia        | Ex-Secretary, Dept. of Bio-technology, Govt. of India) Navi Mumbai                |
| 13. *Late. Prof. R.F.E. Crang | Former Professor, University of Illinois, U.S.A.                                  |
| 14. *Dr. Anjum Farooqui       | Scientist, BSIP, Lucknow  |
| 15. *Dr. Meetu Gupta          | Assistant Professor, Department of Biotechnology, Jamia Millia Islamia, New Delhi |

- 
- |     |                              |   |
|-----|------------------------------|---|
| 16. | *Dr. Tariq Husain            | Scientist, CSIR-NBRI, Lucknow   |
| 17. | *Prof. Muhammad Iqbal        | Ex-Professor, Botany Dept. Hamdard Univ., New Delhi   |
| 18. | Prof. Mohd. Latif Khan       | Professor, Department of Botany, Dr. H.S. Gour Central University, Sagar  |
| 19. | *Prof. R.K. Kohli            | Vice-Chancellor, Punjab Central University, Bathinda  |
| 20. | *Dr. Kamla Kulshreshtha      | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 21. | *Prof. Kumkum Misra          | Professor, Department of Botany, Lucknow University, Lucknow  |
| 22. | *Dr. C.S. Nautiyal           | Bose Fellow, Ex-President ISEB & Ex-Director, CSIR-NBRI, Lucknow  |
| 23. | *Prof. L.M.S. Palni          | Vice-Chancellor, Graphic Era Univ., Dehradun  |
| 24. | Dr. Vivek Pandey             | Scientist, CSIR-NBRI, Lucknow   |
| 25. | *Dr. P. Pushpangadan         | Ex-President ISEB & Ex-Director CSIR-NBRI, Director General & Sr. Vice President, RBEF, Amity Institute for Herbal & Biotech Products, Thiruvananthapuram |
| 26. | *Dr. U.N. Rai                | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 27. | Prof. Pramod Wasudeo Ramteke | Dean, P.G. Studies, Sam Higginbottom Institute of Agriculture, Technology & Sciences, Naini, Allahabad  |
| 28. | Dr. Parth Sarathi Roy        | Honorary Professor, UCESS, University of Hyderabad, Hyderabad   |
| 29. | *Dr. P.V. Sane               | Ex-President ISEB & Ex-Director CSIR-NBRI, Lucknow  |
| 30. | *Dr. Samir V. Sawant         | Scientist, CSIR-NBRI, Lucknow   |
| 31. | Prof. P.K. Seth              | Ex-Director, CSIR-IITR, Ex CEO Biotech Park, Lucknow  |
| 32. | Dr. S.C. Sharma              | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 33. | Prof. Y.K. Sharma            | Professor, Department Botany, Lucknow University, Lucknow   |
| 34. | Dr. B.P. Singh               | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 35. | *Prof. K.P. Singh            | Ex-Professor, BHU, Varanasi   |
| 36. | Dr. Mrs. Nandita Singh       | Consultant Scientist, CSIR-NBRI, Lucknow  |
| 37. | Prof. Rana Pratap Singh      | Professor, BBA Univ., Lucknow   |
| 38. | Dr. S.N. Singh               | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 39. | *Dr. Sarita Sinha            | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 40. | *Ms. Kanti Srivastava        | Ex-Scientist, CSIR-NBRI, Lucknow  |
| 41. | *Prof. Pramod Tandon         | CEO, Biotech Park, Lucknow  |
| 42. | Dr. R.D. Tripathi            | Emeritus Scientist, CSIR-NBRI, Lucknow  |
| 43. | Dr. Renu Tripathi            | Scientist, Parasitology, CSIR-CDRI, Lucknow   |
| 44. | Prof. R.S. Tripathi          | INSA Sr. Scientist, CSIR-NBRI, Lucknow  |
| 45. | Dr. Prabodh Trivedi          | Scientist, CSIR-NBRI, Lucknow   |
| 46. | *Dr. Rakesh Tuli             | Ex-President ISEB & Ex-Director, CSIR-NBRI, Mohali, Punjab  |
| 47. | Dr. D.K. Upreti              | Scientist, CSIR-NBRI, Lucknow   |
| 48. | *Prof. C.K. Varshney         | Professor Emeritus, Environmental Sciences, JNU, New Delhi and Distinguished Adjunct Professor, AIT, Bangkok  |
| 49. | *Prof. H.N. Verma            | Vice-Chancellor, Jaipur Nat. Univ., Jagatpura, Jaipur   |
| 50. | *Prof. Mohd. Yunus           | Vice-Chancellor, M.A. Jauhar University, Rampur   |

\*Awarded in absentia

#### **4. Sixth International Conference on Plant and Environment (ICPEP-6) (27-30 November, 2018)**

Nature has provided the basic ingredients for living in abundance and whatever is used up during normal course of living is recaptured through natural cycle. Any effort to disturb this process leads to environmental pollution. Human beings are exposed to pollutants in many ways through the air they breathe, the water

they drink, the food they eat and the cosmetics, drugs and other products they use. Pollution prevention is a major global concern because of the harmful effects of pollution on a person's health and on the environment.



The trans boundary nature of environmental pollution makes even more difficult to manage. Climate change is the biggest threat faced by the planet today. When it comes to the hazards of environmental pollution, there is only a very thin dividing line between developed and developing countries now. One pollutes and the other suffers from its consequences equally, if not more. The Sixth International Conference on Plants and Environmental Pollution (ICPEP-6) was organized during November 27-30, 2018 with the aim to bring together leading academicians, scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Environmental Pollution and Plants. It also provided an excellent interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends and concerns as well as practical challenges encountered and solutions adopted in the fields of Environmental Pollution and Plants.



Prestigious international and national scientific organizations such as International Union of Biological Sciences (IUBS), Paris, France; International Union of Forest Research Organizations (IUFRO), Vienna, Austria; Council of Scientific and Industrial Research (CSIR); Indian National Science Academy, Department of Science & Technology (DST); Department of Biotechnology (DBT); Indian Council

of Agricultural Research (ICAR); National Biodiversity Authority (NBA); State Bank of India (SBI) and National Bank Agriculture and Rural Development (NABARD) sponsored the ICPEP-6.

The conference was jointly organized by International Society of Environmental Botanists (ISEB) and CSIR-National Botanical Research Institute at CSIR-NBRI, Lucknow, India.

The Conference was formally inaugurated by Shri Ram Naik, Hon'ble Governor, Uttar Pradesh. Prof. J.S. Singh, INSA honorary and renowned scientist and Prof. Albert Reif, Institute of Forest Sciences, Faculty of Environment and Natural Resources, Albert-Ludwigs University, Freiburg, Germany, graced the occasion as Guests of Honour. In the inaugural session at CSIR-NBRI, Lucknow, Hon'ble Governor welcomed all the delegates and the distinguished scientists from all over the world to Lucknow. He hoped that this gathering would provide an opportunity to discuss and draft the solution for consistently increasing problems due to climate change and environmental pollution, affecting millions of people around the globe. Hon'ble Governor mentioned that the pollution not only affect plants but also indirectly affect the insects and other animals dependent on that plant, hence research is needed to find out the impact of pollution on plants and animal products used by human beings in daily life. He also emphasized the need to find out new energy resources in order to meet out the energy demand in future in context to ever increasing human population and consistently changing environmental conditions. He wished a great and comfortable stay to all the delegates and also to enjoy the history, culture and delicious dishes of Lucknow. He suggested that everyone should plant at least one tree in honour of his or her life partner. Earlier, Prof. S.K. Barik, Director, CSIR-NBRI, Lucknow welcomed all the guests and dignitaries and apprised about the history and achievements of the CSIR-National Botanical Research Institute in general and the area of Ecology and Environmental Science in particular. Prof. Albert Reif, in his address discussed the impacts of forest conservation with examples of oak trees.



On this occasion, Hon'ble Shri Ram Naik, honoured nine scientists and researchers with Fellowship of the International Society of Environmental Botanists (FISEB). The dignitaries also released the Abstract Book of the Conference (ICPEP-6), ISEB Newsletter and a Research Journal, International Journal of Plant and Environment.

INSA Honorary Scientist, Prof J.S. Singh delivered a lecture on current environmental crisis and discussed the impact of climate change and environmental pollution due to human activities. He informed about the crucial fact that how we are losing about 1800 populations of different species at an hourly rate. At this rate, about 25% species of different organisms will be on the verge of extinction by the year 2030. Not only this, global warming will increase the temperature by 5 degree, affecting the shore lines and will increase the sea level by 88 cm as estimated by 2100, ultimately resulting in the submergence of many low lying coastal areas.



During Conference, around 400 delegates from 20 countries participated. Distinguished scientists from India and abroad delivered key note addresses and special lectures. Total 413 abstracts were received and were categorised into 8 scientific sessions, which included 174 oral and 239 posters presentations. As the number of speakers was large, lectures were conducted in three concurrent sessions in three halls. The conference provided a vibrant interactive forum for serious discussions on the pressing problems of pollution and the role of plants in its amelioration.

Deliberations in scientific sessions focused on: Climate change: adaptation, mitigation, carbon sequestration and food security; Biodiversity, prospection and conservation; Environmental biotechnology and microbiology; Environmental impact assessment; Sub-tropical and tropical oaks under global change; Bio monitoring and bio-remediation; Plant responses to environmental pollution; and Contemporary issues in environment and plant.

A special talk by Prof. C.K. Varshney, Professor Emeritus and former Dean, School of Environmental Sciences, Jawaharlal Nehru University and Visiting Professor, Asian Institute of Technology, Bangkok, was delivered on “Biodiversity: A vital resource for civilization, economic development and well being”, highlighting the serious threats to biodiversity which may amplify climate warming, leading to unforeseen and potentially irreversible shifts in the earth system. One special session devoted to Prof. H.S. Srivastava Foundation for Science and Society (PHSSFSS) was also organized and Prof. Albert Reif from University of Freiburg, Germany delivered the Prof. H.S. Srivastava Memorial Lecture. He was felicitated with the PHSSFSS Medal for his contribution in the area of forest ecosystem management.



The key note lectures were given by leading researchers in relevant fields. In climate change session, Prof. Erwin Grill, Chair of Botany, Technical University of Munich, Germany, delivered key note lecture on “Challenges and chances to get more crop per drop by using abscisic acid receptors”. He addressed the mechanisms involved in the homeostasis of plant’s water status through control of transpiration by the phytohormone abscisic acid. In the biodiversity session, Prof. P. Pushpangadan, DG of Amity Institute for Herbal and Biotech Products Development, Thiruvananthapuram and Senior Vice President of the Ritnand Baldev Education Foundation, New Delhi, India emphasized the importance of genetic diversity which would enable the breeders to tailor crops to meet the increased productivity, adapt changing climatic conditions and disease resistance. In another key note presentation in session Environmental Biotechnology, Dr. Alok K. Sinha, Scientist, National Institute of Plant Genome Research, New Delhi, India talked about regulation of submergence tolerance in rice by a mitogen activated protein kinase. He discussed the role of protein kinase, MAP/MAPK cascade in seedling development in Arabidopsis and submergence tolerance in rice. His group has performed various physiological, biochemical, molecular and genetics related experiments to highlight pleiotropic roles of MAP kinase cascade in plants.



In session on Environmental monitoring and Bioremediation, Prof. Lena Q. Ma, University of Florida, USA through her key note address highlighted the molecular mechanisms behind the efficient arsenic uptake and detoxification by *Pteris vittata* and optimizing its arsenic hyperaccumulation capacity for phytoremediation application in contaminated soils. In the same session, Prof. Om P. Dhankher, University of Massachusetts, USA emphasized on the glutathione homeostasis which plays important role in maintaining cellular redox for protection of plants under

abiotic stresses and holds great potential for developing climate resilient crops, as well as developing plants for phytoremediation of toxic metals and metalloids. In the session on Contemporary Issues in Environment and Plant Mr. Mahendra Modi, DGP, UP, India delivered a key note lecture on the innovative methods for rain water harvesting through his water conservation models for buildings in Indian cities.

Following the keynote lecture on the role of abscisic acid receptors in harvested more crop per drop, other lectures in ‘**Climate Change**’ dealt with the various adaptation and mitigation strategies, carbon sequestration monitoring in different areas of the world and food security in the changing climatic condition, emphasizing on the increasing stress on agricultural systems due to the climatic changes, leading to decrease in yield at the time when demand for food is growing dramatically.



Following a special lecture focusing on biodiversity as a sustainable resource for economic development for population and civilization, other lectures in the session of ‘**Biodiversity Prospction and Conservation**’ focused on the impact of changing climate and weather condition on local as well as global food, fiber and forest production and ecosystem goods and services. Exploration was to identify genotypes through environmental interactions, to understand the variability and to assist the breeders select the best lines of plants suited in a changing climate.

The session on ‘**Environmental Biotechnology and Microbiology**’ emphasized on the genomic basis of the responses and adaptation of plants to climate change, abiotic stress tolerance and environmental pollution in order to use genetically improved plants for sustainable management of the environment stresses. The session also dealt with assessing the role of microbes in reducing environmental stress induced in crops.

The fourth session was especially devoted to the ‘**Environmental Impact Assessment**’ studies in coal mining, urban roadside environment, straw burning during conservation agricultural practices, heavy metal and pesticide, etc. to assess the impact on the environment – air, water, soil, biological and socio-economic and give some management strategies.

A special session, ‘**Sub-tropical and Tropical Oaks under Global Change**’ was organized to discuss the impact of global environmental and climatic conditions and human activities on oak forests of sub-tropical and tropical regions. In the opening remark of the session, Prof. S.K. Barik mentioned that Indian oak forests are

under considerable threat as only 30% of the oak vegetation is now remaining as they are consistently being utilized for firewood, hence there is need to study the various issues related to the conservation of the forest. Oak is native to the northern hemisphere and extends from cold latitudes to tropical Asia and the America. Prof. Albert Reif in his key note lecture on ‘Regeneration Ecology of Oaks’, informed that deciduous oaks are important components of temperate forests, providing many ecosystem goods and services such as timber and firewood, acorns for feeding, tannins and others. Several factors including predation of acorns by rodents, wild pigs and other animals, fungal infections, competition with ground vegetation, water supply etc., affect the germination, establishment and growth of oak forests. However, it was observed that some deciduous oaks are stress-tolerant pioneers. Another key note speaker highlighted the comparative analysis of genetic diversity of oak species in Mexico. He inferred that hybridization between the oak species was responsible for high level of genetic diversity. Prof. R.S. Tripathi, CSIR-NBRI, emphasized on the considerable implication for the silviculture and management of oak forest. Some presentations demonstrated ecophysiological analysis involving stable C and O isotopic signatures of the tree rings for restoration of Fagaceae forest in NE India. Presentation also emphasized on the utilization of remote sensing technology leading to identification of minimum size of declined forest patches. The experts in the session also discussed the status of Himalayan oak forests. It was inferred that Himalayan oak forests are under serious threat. Though the regeneration potential of Himalayan oak forests is high, the rate of their survival and establishment is very poor. During the discussion on the reasons of poor survival and establishment, it was observed that litter removal from forest floor leads to poor acorn germination as exposed acorns are desiccated and become unviable. Acorn predation by rodents and other animals also hampers the germination percentage. It was reported that only one out of 10,000 acorn results in an eventual tree. Invasion by pine forests is also posing threat to the oak forests. Thus a successful gathering was concluded with fruitful panel discussion to strategise the regeneration of oaks. The panel concluded with an initiative for an international oak group especially for bilateral research programme on oaks.



Besides, outstanding key note presentations by Prof. L.Q. Ma and Prof. Om P. Dhankher, the ‘**Biomonitoring and Bioremediation**’ session was covered by various presentations covering biomonitoring of water, air, global warming and soil

contamination indicators and biomarkers. Presentations also included grasses as biomonitoring agents for global warming and their remediation through carbon sequestration. Some presentations dealt with hair as biomarker of vehicular heavy metal pollution. It also included various presentations dealing with bioremediation techniques to reduce the contamination from air, water and soil especially metal/metalloid through intervention of plants, fungus and nanotechnology. The role of plants like algae, lichen, fern, microflora, macroflora etc., was also emphasized by several speakers for biomonitoring. Some of the presentations highlighted the role of nutrient like Se and microbes to reduce As contamination of food crop. Presentation also highlighted development of low grain arsenic rice variety for arsenic contaminated regions, such as West Bengal and others.

The session on the **‘Plant Responses to Environmental Pollution’**, included the plant response to various stresses such as UV-B, ozone, heavy metal and metalloid, nanoparticles, salinity, benzyl butyl phthalate etc. The responses also showed pollutant toxicity amelioration by various abiotic components such as silicon, selenium, nitric oxide,  $\gamma$ -aminobutyric acid (GABA), salicylic acid, thiourea, ethylene di urea (EDU) and biotic components such as algae, bacterial consortia and mycorrhizal fungi at morphological, physiological and molecular level of various non crop and crop plants. Presentation topic included important air pollutants vis-à-vis plants water relations as also the drought responses in crop plants.

Besides, a key note presentation on water conservation models, session on **‘Contemporary Environmental Issues’** covered a lot of relevant presentations such as, bioprospection of endemic plants, system biology approaches in medicinal plants, legal aspects of air pollution, ionization radiation and human health, organic farming etc.

There was an enthusiastic participation of young researchers in presenting their research findings through the posters. The posters were evaluated by a committee comprising reputed scientists. Fourteen posters were awarded prizes for new concept and scientific content.

The Valedictory session was organized after the scientific sessions on the afternoon of 30<sup>th</sup> Nov, 2018 which was chaired by Prof. S.K. Barik, President ISEB & Director CSIR-NBRI, wherein, some distinguished delegates from different countries expressed their views about the outcome of the Conference. At the end of this session, Conference recommendations were presented and inputs taken from delegates.



## ICPEP-6 Publications



**ICPEP-6 Recommendations:**

- Keep as much vegetation as possible particularly deep rooting plants. Tree plantations must be done to purify the air and to cool the cities.
- Combating global warming through afforestation for mitigating global GHGs emissions. Strategies for climate resilient agriculture in the era of global warming.
- Comprehensive studies on evaluating ecosystem services for their broad tangible and intangible benefits. Strategies to reduce biodiversity depletion and its linkage with invasive species and steps for its conservation. Bioprospection, biodiversity as a bulwark for pollution and climate change.
- Strategies for reducing Arsenic levels within permissible levels in soils and crops for sustainable environment, agriculture and human health. Development of crop varieties with safe Arsenic levels. Strategies for submerge tolerance in crop plants. Organic farming for sustainable agriculture and population health.



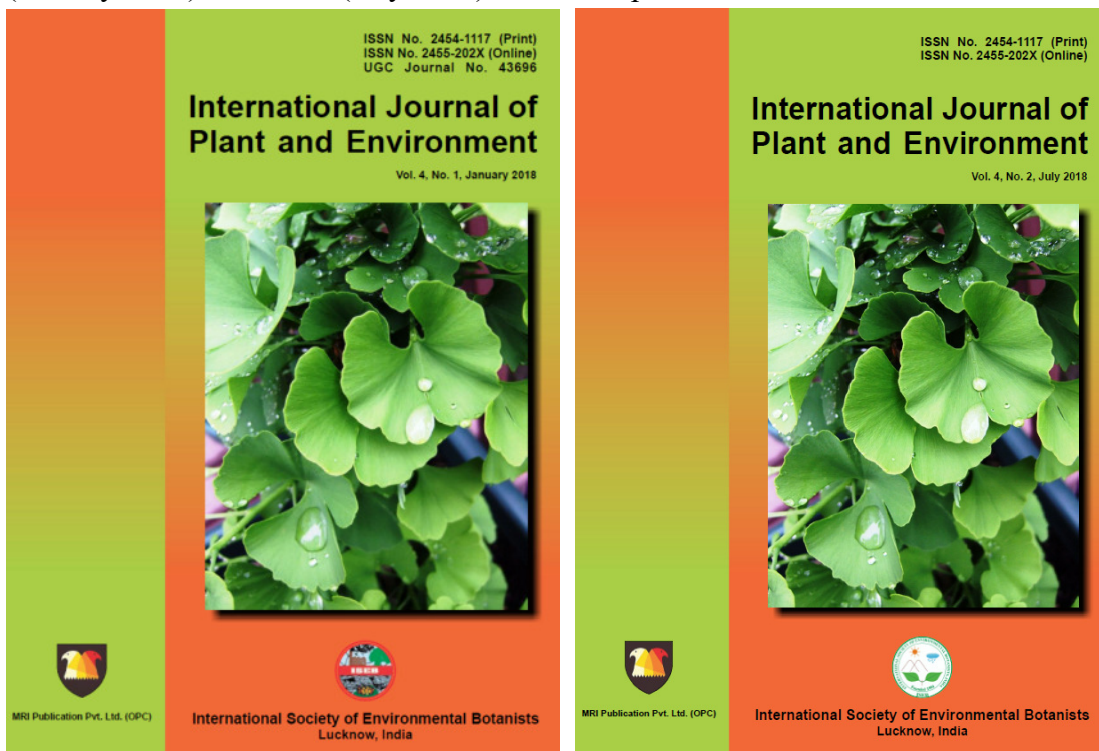
- Biomonitoring of water, air and soil resources. Application of plant based technologies to lower pollution load including noise pollution in the environment.
- Appropriate measures to reduce emission and formation of primary and secondary air pollutants.
- Identification and development of pollution stress tolerant plant varieties having pollutant scavenging and assimilating properties.

- Evaluation and implementation of various cost effective plant and microbe based pollution mitigation strategies. Development of safe technologies for post harvest utilization of biomass and biofuel production.
- The biological ecosystem study should be a major part of EIA document for environmental clearance of developmental projects.
- Research and technology development should be fostered in the areas of: 1) Ecology, 2) climate smart silviculture, 3) sustainable forest management, 4) biodiversity and conservation, 5) genetics, and 6) economic value addition. Inter- and transdisciplinary approaches will be used in future research and technology development for oak forest.
- A research consortium with 35 researchers from 14 countries is formed. The countries are: Algeria, Austria, Bhutan, China, Germany, India, Iran, Italy, Mexico, Nepal, Portugal, Sweden, United States of America, and Vietnam. The research consortium aims to: 1) develop bilateral or multilateral research and development projects on oak trees and forests, 2) promote networking and knowledge transfer, 3) fostering and mentoring exchange programs between nations especially for young scientists engaged in research and development on oak trees and forests.
- To develop strong mechanism to promote environmental education and awareness among young people and public through outreach activities.

### Sponsors of ICPEP-6



**5. International Journal of Plant and Environment (IJPE):** A biannual international journal was published by the society during the period. Volume 4, No. 1 (January 2018) and No. 2 (July 2018) have been published.



**6. ISEB Fellowship Awards 2018:**

ISEB FELLOWS - 2018	
The Executive Committee of ISEB which met on 9th October 2018 considered the recommendations of ISEB Fellowship Committee and unanimously approved the same. Prof. S.K. Barik accorded his approval to the recommendations. The award certificates will be duly presented to the awardees by the President ISEB at the inaugural function of ICPEP-6 on 27th November 2018 at CSIR-National Botanical Research Institute, Lucknow.	
1. Prof. Erwin Grill	Department of Botany, Technical University of Munich, Germany
2. Prof. Lena Q. Ma	Soil & Water Sciences Department, University of Florida, Gainesville, Florida, USA
3. Dr. Debasis Chakraborty	CSIR-National Botanical Research Institute, Lucknow
4. Prof. Kusum Arunachalam	School of Environment and Natural Resources, Doon University, Dehradun
5. Dr. Rajesh Bajpai	Lichenology Laboratory, CSIR- National Botanical Research Institute, Lucknow
6. Dr. Sanjay Dwivedi	CSIR- National Botanical Research Institute, Lucknow
7. Dr. Seema Mishra	DDU Gorakhpur University, Gorakhpur
8. Prof. Shashi Bhushan Agrawal	Department of Botany, Banaras Hindu University, Varanasi
9. Prof. Surya Kant	Department of Respiratory Medicine, KGMU, Lucknow
10. Prof. Uma Shankar	North-East Hill University, Shillong, Meghalaya
<b>ISEB Young Scientist Award</b>	
Dr. Amit Kumar	Dept. of Botany, Lucknow University, Lucknow

**7. Foundation Day:** Foundation day of ISEB was celebrated on 22<sup>nd</sup> December 2018.