



ENVIRONNEWS

INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS

Newsletter

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Fourth International Conference on Plants & Environmental Pollution (ICPEP-4)

7-10 February 2010
Venue: NBRI, Lucknow, India

Organized by
National Botanical Research Institute (NBRI), Lucknow, India
and
International Society of Environmental Botanists (ISEB)

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Pre-registration open (Online/E-mail/Mail)

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- Informative news, views and popular articles/write-ups on current environmental researches/issues are invited for publication in ENVIRONNEWS.
- Environews is published quarterly on the first of January/April/July/October; and is supplied free to all members of ISEB.
- Environews is also supplied in exchange for scientific literature published by reputed organisations.
- All correspondence should be addressed to : **The Secretary, International Society of Environmental Botanists**, National Botanical Research Institute, Lucknow - 226 001 (India).
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LETTERS

I received the *EnviroNews* January 2009 issue. I would like to mention here that your researches and publications on environment will unfold the secrets of nature which will help the scientists to thwart the dangers arising out of environmental degradation. I believe that the future of mankind rests on the environmental scientists. Therefore, their success will be the success of entire humanity.

Jagdish Gandhi

Founder Manager, City Montessori School, Lucknow

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I received the New Year issue (Volume 15, No.1, January 2009) of the *EnviroNews*, with a front page message from the president of the Society, a few days ago and it made a very interesting reading. This issue also reflects the progress it has been making continuously from year to year and the increasing professionalism with which it is being produced. Please accept my sincere appreciation of the good work which you and your team has been doing in this regard and I hope and pray that it keeps on going from strength to strength.

The contents of this particular issue could very well have formed a part of a full-fledged research journal devoted to the environmental issues. And that brings to my mind your hope and aspiration to convert this newsletter into a research periodical and that it would have been possible to do so if a suitable person was around. Well, I don't think you need to be told that distances have been totally obliterated in the present era of highly sophisticated telecommunications. With the ready availability of internet facility, e-mail, distance education, teleconferences, teleclassroom lectures and what have you, I don't think that is a problem at all. Everything, these days, is just a 'mouse' away.

What is needed is a policy decision to this effect, availability of the required funds and a little bit of extra secretarial set-up. Think over it seriously, discuss it with your executive body and arrive at the final decision. Rest will not be so difficult. You have already got eminent contributors world wide and a sizeable readership, the two basic requirements for starting a research journal.

With best wishes for more power to your elbow.

**B.R. Juneja
Bhopal**

(Formerly Scientist & Head, Economic Botany Information Service National Botanical Research Institute, Lucknow)

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The **BBVA Foundation**, in collaboration with the **Spanish Council for Scientific Research (CSIC)**, is pleased to announce the Second Edition (2009) of the **BBVA Foundation Frontiers of Knowledge Awards**; and to invite you to participate by nominating a candidate or candidates through your Organization following the instructions provided on the Foundation website: www.fbbva.es/awards

The Frontiers of Knowledge Awards take in the following eight categories: Basic Sciences (Physics, Chemistry, Mathematics); Biomedicine; Information and Communication Technologies; Ecology and Conservation Biology; Economics, Finance and Management; Contemporary Music; Climate Change and Development Cooperation.

Award in each category carries a prize money of € 400,000, a diploma and a commemorative art work.

It would be an honour for us to count your organization

Rafael Pardo

Director, BBVA Foundation

Plaza de San Nicolas, 4

48005 Bilbao, SPAIN

Rafael Rodrigo

President CSIC

Paseo de RaCalactas, 10

28001 Madrid, SPAIN

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among those nominating a candidate.

I would like to receive a student for M.Sc. or Ph.D from India. Would you please help to recommend a proper student from your institute or other universities?

I will help him in getting a scholarship from the Chinese Academy of Sciences, and we can work together to train the student.

Chen, Tao

Shenzhen Fairy Lake Botanical Garden

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I have in the recent past, joined the King Saud University in Riyadh (Saudi Arabia). Several stands of *Juniperus procera* in Saudi Arabia are declining through branch die-back. In the prima facie, it looks to be due to drought stress. However, scientific investigations in progress may offer an authentic opinion. In the Department of Plant Production (Forestry Section), we have undertaken a study of

modulation of antioxidant defense system, seasonal cambial activity and wood accumulation pattern, as influenced by the branch die-back in this species. We are also studying growth patterns of different species of *Acacia* in different environmental regimes of Saudi Arabia.

Prof. Muhammad Iqbal, FNASc
Department of Plant Production
College of Food & Agriculture Sciences,
King Saud University,
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Thank you very much for mailing Environews Jan 2009. I was very impressed with the content and would appreciate to also receive the following editions.

Kurt Schaefer K & V Schaefer
E-mail: desertgreening@gmail.com

I am now planning to attend and present our research results about ozone exposure effects on rice production at the 4th ICPEP.

This will be my first visit to India. I will appreciate if you could guide and advise me about planning my trip to India to attend ICPEP-4 Conference organized by ISEB and NBRI, Lucknow in February 2010.

Yoshihisa Kohno
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I am looking for some fresh leaves of *Lotus nucifera* (or of other *Lotus* variety). I need them in Italy, but here in Europe the plant will not grow before next 60 or 90 days. I need these leaves to be used now as a scientific-educational exhibit that proves the super-hydrophobic properties of their surface. Could you please help me informing where may I ask for a fast delivery shipment of some leaves?

Giacomo Torzo
ICIS-CNR and Phys Dept. of Padova University
via Marzolo 8, 35131 Padova, **ITALY**
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This is to inform you that the NAPA formulation project in Nepal is still looking to fill 2 positions (a Climate Change Specialist and a Climate Change Network Facilitator). Please let me know if someone suitable comes to mind or if you have some suggestions or CVs to share. The work is extremely interesting, as the NAPA process in Nepal is reinforced with substantive co-financing from DFID and the Danish government. This brings some critical mass to the NAPA and will enable it to shape into a central convening platform for Climate Change in the country. The positions would essentially start on an SSA basis (as soon as possible),

but there is a clear perspective to have these contracts transferred into more permanent, project-funded assignments. The overall time horizon of these postings will be around 18 months (minimum), duty station will be the Ministry of Environment, Science and Technology (MoEST) in Kathmandu.

Gernot Laganda
Kathmandu, **NEPAL**
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We came to know about your esteemed society and its activities. We are highly impressed with the spectrum of activities you are involved in to save our mother earth and meet the goal of sustainable development.

You would be happy to note that we have been serving the society for about last 60 years in terms of providing trained manpower in the field of key functional areas of management including environment and energy security. Our Institute is also actively involved in research and consultancy projects to provide tailor-made solutions for various key areas directly concerning with social development including environment and social issues.

We would be communicating very soon our few research papers for your kind consideration to be published in your esteemed research journal.

Dr. Sarbani Mitra
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Please help disseminate the following information on the 2009 APFED Showcase Programme through the network of your organization (ISEB):

Asia Pacific Forum for Environment and Development (APFED) is a regional group of eminent experts that aims to address critical issues facing Asia and the Pacific region and to propose new models for sustainable development. To promote sustainable development in the region, APFED launched the APFED Showcase Programme as one of the main activities. The APFED Showcase Programme, grants up to **US\$ 30,000** to Asia Pacific projects that demonstrate innovative approaches. The deadline for the submission of the proposal is 31 May 2009. Further information such as eligibility, how to apply, and proposal format can be obtained from the following website: www.apfedshowcase.net

Aretha Aprilia
United Nations Environment Programme
Regional Office for Asia and Pacific, Bangkok,
THAILAND.

WELCOME NEW LIFE MEMBERS

Dr. C.R. Bhatia, FNA, an internationally renowned geneticist, plant breeder and agricultural biotechnologist of India, is a former Secretary to Government of India, Department of Biotechnology, New Delhi. Earlier, he was associated with the Bhabha Atomic Research Centre, Mumbai where he carried out his outstanding researches, which won him many laurels, honours and awards.

ISEB is really privileged to have a scientist of his eminence and stature as its Life Member.

E-mail: neil@bom7.vsnl.net.in

Prof. Ashok K. Bhatnagar is a Professor at the prestigious Department of Botany, Delhi University. He also headed this department for a period of three years (2005-2008). During his research career, spread over a period of 40 years, Prof. Bhatnagar has made outstanding contributions in the fields of Reproductive and Seed Biology, Biodiversity and Environmental Biology.

He has published over 200 research papers, review articles, semi-technical publications, popular articles, chapters in books and presented papers at a large number of national and international symposia and edited several books. He has steered a number of research projects as a Principal Investigator.

Prof. Bhatnagar has been associated with a large number of universities, academic bodies, research institutions and several environmental education programmes. He acted as Chairman, Working Group on Botany, National Science Digital Library (NISCAIR). He is a Member, School Board of Life Sciences North-Eastern Hill University, Shillong; Advisory Committee, Bioresources, University of Kashmir; National Steering Committee on Eco-Development Camps, Ministry of Environment & Forests, New Delhi. Prof. Bhatnagar has a special interest in editorial work and is associated with a number of scientific journals as an editor or as a member of their editorial boards.

E-mail: akb_du@rediffmail.com

Dr. Mridul Kumar Shukla is associated with the Ecotoxicology & Bioremediation Group of National Botanical Research Institute, Lucknow, India as a researcher. He has been awarded Ph.D. degree in Botany from Lucknow University in 2009 on the topic "Response of some Cyanobacteria and Crop Plants Grown under Fly ash & Heavy Metals".

Dr. Shukla organized six Science Awareness

Conferences on Agriculture, Health, Biotechnology, unemployment and flood. He received Best Research Paper Award at the national conference on Water management held on 31 August 2003 at HBTI, Kanpur. Dr. Shukla has published several research papers in the journals of international repute. He has also published 13 popular articles on various environmental issues.

E-mail: mridul_shukla@rediffmail.com

Dr. Rajesh Bajpai is currently doing post-doctoral research at the Lichenology Laboratory of NBRI. He obtained the Ph.D. degree in Environmental Science from Babasaheb Bhimrao Ambedkar University, Lucknow. Dr. Bajpai has published scores of research papers on environmental topics in national and international journals on monitoring pollution with the help of lichens, industrial waste management, biotechnology and bioremediation.

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bajpaienviro@gmail.com

Mr. Bhagwan Das Rathore, M.Sc. in Horticulture is associated with the Department of Botany, North-Eastern Hill University, Shillong, Meghalaya.

Er. Deepak Erasmus is Managing Director, 'Green Route' (Landscaping & Gardening Services/Agri-Horticultural Consultancy Services) at Bishnupur, Shillong, India.

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Dr. Vinay Singh Baghel is a Lecturer at the School of Environmental Science at Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow.

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Dr. Rajeev Kumar is a Horticulturist, associated with the Botanic Garden Division of National Botanical Research Institute, Lucknow.

Dr. Shankar Varma is a Horticulture Officer at Banthra Research Station, National Botanical Research Institute, Lucknow

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Dr. Ajit Kumar Mathur, a former Senior Scientist at NEDA is the founder Managing Director of the organization, Society for Progressive Research Extension Action & Development (SPREAD), Lucknow.

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NEWS FLASH

Dr. A. Arunachalam, Associate Professor in Forestry at Northeastern Regional Institute of Science & Technology, Nirjuli, Arunachal Pradesh, India, and a Life member of ISEB, has been conferred the 'Environmental of the Year (2008)' award by the National Environmental Science Academy, New Delhi for his significant research contributions in the field of Restoration Ecology & Natural Resources Management. Earlier he was elected as a Fellow of the National Institute of Ecology.

Dr. S.N. Pandey, Lecturer in Botany, University of Lucknow and, a Life member of ISEB, has been honoured with a gold medal by the Zoological Society of India for his outstanding research and academic contribution in the field of Environment Sciences at a national conference organized by

Gauhati University, Assam. Dr Pandey is engaged in research on nutritional physiology and environmental biology with particular emphasis on heavy metal toxicity in environment and its bioremediation.

Dr. Mrs. Kamla Kulshreshtha, a Scientist at NBRI, Joint Secretary of ISEB and an editor of Environews has been made a Full Individual Member of the Third World Organization for Women in Science (TWOWS), Trieste, Italy.

Prof. R.S. Tripathi, FNA, Life Member and Advisor ISEB, participated in the International Conference on "Plant Invasion and Forest Ecology: Concerns and Solutions" held at Punjab University, Chandigarh during 16-18 March, 2009. He delivered a lead lecture on "Population dynamics of invasive alien weeds: an ecological

perspective" and chaired a Technical Session. The Conference was sponsored/organized by IUFRO, DNAES, APFISN (Asia Pacific Forest Invasive Species Network), Punjab University, CSIR and DST.

Dr. S. C. Sharma, Vice-President of International Society of Environmental Botanists delivered an invited lecture on "Urban Pollution and Solution" at the Annual Meeting of Club of Lucknow on 7 March, 2009.

Awareness Programme

ISEB organized an Environmental Awareness Programme for rural folks in Pyarepur village, district Barabanki on January 27, 2009. The daylong programme was conducted by Ms. Kanti Srivastava, Convener, ISEB Awareness Programme Committee and her team of student volunteers.

Species watch groups – key to biodiversity conservation

Monika Koul¹ and A. K. Bhatnagar²

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India, with 2.4 per cent of the global land and 15 per cent of human population, is also home to about seven per cent of world flora. Of the 47,500 species of plants recorded in the country, one third are endemic to one or the other part of the subcontinent (BSI, 2000). The variation in physical factors has resulted in an enormous range of diversity among the biotic components too. Much of this diversity of plants exists in areas of climatic extremes, such as the high Himalayas, or in salubrious but competitive environments such as in the Western and Eastern Ghats. Interestingly, the biodiversity map of India coincides with the areas of rich forests, where live most of the tribal communities, and which also

incidentally are often the watersheds and catchment areas of our major river systems. Conservation efforts are sure to yield rich, multiple benefits.

Plant diversity is linked to ecology and human welfare in more complex manner than usually realized (Ramakrishnan, 2001; Kumar, 2001). Because of our excessive dependence on plant resources for life and livelihood, overexploitation seems inevitable, but conservation is the dire necessity for sustenance.

Ethnobotanical studies indicate that the rural and ethnic communities continue to depend significantly on the vast range of plant species, available in their neighbourhood. Food, fibre and

oil come from a few cultivated or wild species. For fuel and fodder, some common trees and shrubs are handy, but a large number of species is targeted for medicine. Of the 1,500 species of flowering plants considered threatened in India, listed in the Red Data Book of Indian Plants (IUCN, 2007), a vast majority is of medicinal value. Overexploitation and habitat degradation are recognized as major causes of loss of plant species or their genetic diversity. Pollution and climate change pose new challenges. With their populations fragmented and density diminished, many species face reproductive stress. Over a period of millions of years, plants have co-evolved with insects, birds, bats and

other animals, which provide invaluable pollination and seed dispersal services in return for food and shelter. Many of these animals, insignificant to man but useful to plants, have also vanished due to factors such as indiscriminate use of pesticides. Little attention is paid to the factors that are disturbing the plant-animal interactions. In forests, from where elephants and tigers can disappear without leaving a trace, it is not difficult to imagine that a vanishing species of a herb or an insect would create no ripples!

National Bureau of Plant Genetic Resources (NBPGR) and the more recently created Protection of Plant Varieties and Farmers' Rights Authority (PPV & FRA) have drawn renewed attention to the need for conserving primitive land races and wild relatives of crop plants. These organizations are in the process of recognizing hotspots of agro-biodiversity where special measures would be adopted for conservation. Considering that each of the about 323 species of crop plants indigenous to India, has thousands of recorded, and yet to be recorded varieties, the task is mammoth.

National framework is in place for conservation of plant diversity. Botanical Survey of India (BSI), is responsible for enumeration of Indian flora and preparing a Red Data Book of Indian plants. NBPGR, a host of crop specific institutes of ICAR, and state agricultural universities/institutes conserve *in situ* and *ex situ* crop germplasm and make it available for crop improvement. The mandated government organizations make no significant effort to involve scientists in academic institutions or NGOs in achieving the unattained objectives set before them. Take the case of the threatened species classified as critically endangered, endangered, rare and vulnerable by IUCN. BSI brought out a list of such species in 1987. There is hardly any documentation on what the current status of these species is, or how many more need to be added to the list, or if some have recuperated and deserve

to be delisted. Plant taxonomists, the few that are left, receive little, if any, direction or help from the BSI or forest departments. It seems that the disappearance of many species is inevitable, and we may not even know what we have lost!

The system of updating and preparing the list of rare, endangered and threatened (RET) plant species is rather centralized with BSI. Animal species which need conservation measures are included in Schedule 1, but plant species are included under Schedule 5. Endangered plant species in Schedule 5 are all angiosperms, thus plants belonging to lower plant groups such as Algae, Bryophytes and Pteridophytes are not taken into account and their loss is regarded inconsequential. Gymnosperms, an important group of plants represented by fewer species and showing a high degree of endemism, also get unnoticed while formulating the conservation strategies.

Very often, botanists have individually reported that certain species recorded in red data lists are not rare; some of these are actually common and found in large populations. At the same time, many species not included in the lists are actually found to be threatened based on individual studies, particularly in the hot spots of Western Ghats and Eastern Himalayas. There is no census of endangered plants like that of the animals. We do not have any idea whether the species in red data lists are getting further decimated or are responding to protection measures. Several parts of the country remain unexplored or little explored.

Traditionally, the botanical community has largely been engaged in the study of various aspects of plants, including morphology, cytology, life cycle, systematics, ecology and chemical components. Their contact with flora of the region was close in the past. With the shift in focus to modern aspects, fewer scientists go to the field. Forest officials, misinterpreting the

provisions of the legal framework for safeguarding biodiversity, often create obstacles in any research work in the forests or wetlands. The large botanical community has no opportunity to participate in the national task of conservation of plant diversity. There is an urgent need to develop a network of dedicated 'Species Watch Groups' all over the country, drawn from among plant scientists and faculty in research institutes, NGOs, University Departments and Colleges. The species that are endemic, threatened, or occur as disjunct populations, or lack sufficient information on their population size, threats, trends and distribution need special conservation efforts. For convenience, to begin with, there can be at least one watch group in each state of the country, but more attention needs to be focused at the hot spots which house much of the plant diversity.

The species watch groups should comprise serving or retired professionals having field knowledge of forests, climate, biota and topography, since all these components are interrelated. Besides 3-5 expert members, each group may include representatives of BSI, ICAR and concerned state forest department. The forest department may serve as the nodal agency with responsibility to provide the necessary infrastructure and facilities. Ideally, the work should be outsourced to suitable NGOs or academic/research organizations. These watch groups should be mandated to periodically visit the field and monitor known or reported RET species. The data should be well documented and form basis for drawing management plan for conservation of individual species. The watch groups can help in assessment of dynamic changes taking place in different ecosystems at a given time and space. More specific biological causes such as reproductive behaviour, status of pollinators and dispersal agents, and effect of invasive species and climate change, also need to be addressed. We

do not even have sufficient data about what should be minimum density of a population of plant species for effective pollination and fertilization. It is also felt that some species need further evaluation to ensure long term species viability. The groups should also assess the degree of human pressure, trade, and success of conservation measures for individual species in measurable terms. The watch group can also be involved in capacity building and generation of awareness for sustainable use of RET species. A network of these watch groups, located at different geographical and climatic zones, can serve many useful purposes. These will help in creating a data pool of existing biodiversity which can be put to statistical analysis and ecological models can be created on this basis. Software networking and availability of data for public viewing and interpretation will generate enhanced response and participation. Generation

of funds for the project is another challenge to cope with. Funds can be generated by approaching World Bank and international agencies involved in the work. Ministry sponsored projects can also be helpful and cater to needs of small working groups. Once the project takes off and proves its utility, further support can be expected.

Species watch groups already exist in many countries of the world such as USA, Britain, Finland, Norway and New Zealand. Watch groups that monitor the life cycle events of monarch butterflies, tigers and pandas are complementing conservation efforts and yielding fruitful results. Some watch groups are ecosystem-specific and many are species-specific. Species watch groups can be formed for monitoring plant species such as *Aconitum balfourii*, *Aconitum heterophyllum*, *Berberis osmastonii*, *Picrorhiza kurroa*, *Swertia chiraytia*, *Coptis teeta* and

Podophyllum hexandrum at high altitudes; *Vateria indica*, *Terminalia travancoria*, *Blepharistemma serratum*, *Erinocarpus nimmonii*, *Meteoromyrtus wynaadensis* *Pseudoglohidion anamalayanum* in Western Ghats; *Pterocarpus santalinus*, *Capparis nilgiriensis*, *Capparis roxburghii* and *Decaschistia rufa* in Eastern Ghats; *Commiphora wightii* in semi-arid regions, and *Xylocarpus* spp. and *Excoecaria marina* in mangrove ecosystems.

The government agencies mandated with the task of conserving biological diversity face multiple challenges. Their resources and infrastructure are limited. The choice is between letting the species vanish, or follow a participatory approach. Setting up of 'Species Watch Groups' can be a small but useful step in the right direction.

HOPE initiative stimulates young minds on health and environment

Gourdas Choudhuri

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It has become evident in recent years that health and environment should be our major concerns if our planet and humanity have to survive and prosper. We continue to burn fuel recklessly, generate tons of CO₂, clear forests for biofuels and cattle, use chemical toxins in everyday life, and pollute our rivers. The price we pay are the polluted air and water we breathe and drink, warming of the globe with its environmental changes, increased frequency of diseases such as diabetes and blood pressure, and the steep steady rise in a variety of cancers.

While most adults read about these issues in magazines and newspapers and occasionally discuss them over dinner, their ways and attitudes have not shown much change. Students, on the other hand, constitute 40% of the

population, have fresher minds, are more receptive to new ideas and may pick up the attitudes that may keep them and the world healthy, if, and only if, they are sounded in time. HOPE Initiative therefore, aims at creating awareness on health and environment related issues in students and try to reach out to the community through the school-to-community approach. Students, being the torch bearers of the next generation, are more likely to take the right decisions to protect our planet than the elders of today.

It all started in November 2004 in Lucknow with a small group of doctors, educationists and philanthropists forming a group to achieve this goal. With the acronym for Health Oriented Programs and Education, HOPE Initiative was born (www.hope.org.in).

Over the years it has grown from a small initiative working in around 30 urban schools in Lucknow to a stage when it is targeting 1000 schools across 10 districts of Uttar Pradesh, India by 2010.

HOPE Initiative focuses on 10 health related topics which it feels, every young citizen should be aware of: lifestyle related diseases, environment, fast food and obesity, sanitation and hygiene Festival Celebrations like healthy Holi and safe Diwali, Hepatitis B, road traffic accidents, examination stress and TAD (tobacco, alcohol and drugs).

Safe and Colourful Festival" Holi"

The festival of colours brings with it lots of joy and fun every year. The vibrant colours and sweets that form an integral part of this festival, also often

bring with them health hazards when toxic chemicals are used or while binging on excessive fatty sweets. HOPE Initiative has been drawing the attention of students to the harmful effects of toxic chemical colours that often cause harm to eyes, skin and kidneys, and urging their replacement with soothing herbal colours. Our message for Eco Holi is "Play Holi Safely" Posters carrying these messages are put up on notice board of schools a few days before HOLI. This year these posters were displayed in 75 schools of Lucknow, Sitapur, Rae Bareilly and Barabanki. Attention of children is drawn not only to the toxic effects of chemical colours to the individual's body but to the environment as well, as they do not wash away easily, get mixed in drains and sewage systems and pollute water bodies and the soil. The spirit of Holi therefore needs to be restored by making it safer and healthier too. Hope Initiative has been fortunate enough to get the desired support from the school authorities in spreading awareness.

Healthy Traditional Snacks

Gorging on "gujias"(a preparation of sweet) is a part of Holi celebrations, but with India becoming the Diabetic capital of the world and 10% of our school children being obese, can they be made less greasy and less fattening? A special pre-Holi cooking session was organized in SGPGI for mothers and housewives had Mrs Smita Singh, a dietician from Nutrition vista, give tips on how to prepare healthier gujias and snacks!

Safe and Happy Diwali - The Eco-friendly way

Diwali is another important national festival to celebrate the victory of good over evil but unfortunately during this time the environment has to pay for our festivities. The celebration style has imposed many negative effects on the environment resulting into excessive air pollution, noise pollution, soil pollution, and excessive power consumption

Besides these environmental effects the modern style of celebrating Diwali also leads to various health hazards. These include hearing loss, high blood pressure, sleeping disturbances, asthma, headache, eye related problems etc.

To make the Diwali celebrations eco-friendly, Hope organized poster-making competition in some of the schools in Lucknow, Sitapur and Rae Bareilly by involving the children to come up and share their views about protecting the environment during the celebration and also reducing the health hazards associated with the festivities. In 70 schools of Lucknow, Sitapur, and Raebareilly the posters on Safe and Happy Diwali were put up for the school children and the staff. It imparted information on health hazards associated with bursting of crackers and its impact on environment. It also contained messages regarding safety precautions for safe Diwali.

To spread a word for celebrating Diwali in a healthy way, by way of propagating healthy food habits, a stall was put up in the Diwali mela organized on the eve of Diwali at the SGPGI campus. The mela was organized for the SGPGI employees and their families. This was to practically demonstrate ways of preparing low calorie food. The students of Hotel Management Institute prepared snacks with slight variation to make them more healthy and tasty. This was to inculcate a habit of consuming and preparing low calorie food during the festival season to avoid health problems.

Sanitation & Hygiene - Health and Environmental Concern

Sanitation and hygiene is another major health concern. There are several govt. programs running to address these problems but still there is lot that needs to be done. Hope Initiative with the intention to spread the message for adopting healthy practices for a healthy living, took an initiative to conduct poster making competition and to organize lectures and Interactive

sessions with students for creating awareness about the issue. The programs aimed to inculcate healthy sanitation habits among school children and their families and propagate the adverse effect of unhealthy sanitation practices on the environment and the ways of improving the sanitary habits and its impact on overall wellbeing.

World Health Day 2008 & Global Warming

On the Occasion of the World Health Day 2008, the issue of Global warming was addressed in the programmes. Hope conducted programs in various schools of Lucknow to propagate the, impact of Global warming on health. This was a concern raised by WHO for 2008, HOPE took the issue to students for their views through debates and extempore competitions organized in schools. The students did research on the topics such as "Global environmental change is a greater concern for health today than life style related disorders" and "Tackling Global warming: role of students" and came up with facts and figures which were thought provoking. Depleting natural resources pose potential hazards for the society and cause climatic change and Global warming, it is important to involve and mobilize children for taking steps in their own way to protect the environment. On the occasion of the World Earth Day. HOPE showed the documentary "An Inconvenient Truth" by Al Gore which is all about the climate change and its overall impact on the environment. Hope Initiative has also been instrumental in motivating school children for planting trees in and around their surroundings. During the World ecology week a plantation drive was organized for the school children.

General Health & the Environment Around

Associating environmental degradation with health will surely draw the attention of masses towards this burning issue, and by creating awareness, the citizens can be mobilized to join in wholeheartedly in

this movement, for making the society a healthier and better place to live in.

Creating a generation with positive patterns

'HOPE initiative' believes that by creating awareness amongst school children we can bring about change in their attitude and build a healthy society

by addressing the relevant issues which have impact on our well being.

Natural attenuation: A potential for environmental clean-up

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Introduction

The environmental pollution in India, is rapidly increasing day by day. The increasing economic development and a rapidly growing population that has taken the country from 300 million people in 1947 to over one billion people today, are putting a pressure on the environment, infrastructure, and the country's natural resources. Industrial pollution, soil erosion, deforestation, rapid industrialization, urbanization, and land degradation are all aggravating the problem. Natural attenuation relies on natural processes to clean up or attenuate pollution in soil and groundwater as a cost-effective technology. Natural attenuation means dilution, dispersion, bio-degradation, irreversible sorption, and/or radioactive decay of contaminants in soils and ground waters. It causes a net reduction of contaminant toxicity and human and ecological risk, but rarely taken advantage of environmental remediation. Instead, contaminants in the subsurface are assumed to be 'time bombs' having near eternal lethality. In fact, most contaminants in soils and ground waters are naturally attenuated rapidly, and much faster than they can be removed by engineering remediation measures.

However, the right conditions must exist underground to clean the sites properly. These various physical, chemical and biological processes of natural attenuation that may occur at a site. A science-based approach to remediation would be to ignore those contaminants which are naturally attenuated and remediate those which are not.

The present approach requires at least an attempt to remove all contaminants and will achieve minor decreases in health and environmental risk but has been estimated to ultimately cost lot of money. Use of unenhanced natural processes as part of a site remediation strategy is called "natural attenuation." Some processes that occur during natural attenuation can transform contaminants to less harmful forms or immobilize them to reduce risks. Such transformation and immobilization processes result from biological, chemical, and physical reactions that take place in the subsurface. These reactions may include biodegradation by subsurface microbes, reactions with naturally occurring chemicals, and sorption on the geologic media that store groundwater in the subsurface.

What is Natural Attenuation?

Natural attenuation is the combination of naturally occurring processes that act without the need of human intervention or enhancement, and result in reduced risks posed by contamination in soil and groundwater. A good working definition is that of the US Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response:

"The 'natural attenuation processes' that are at work in such a remediation approach include a variety of physical, chemical and biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume and concentration of contaminants in soil and water. These in situ processes include biodegradation, dispersion, dilution, sorption, volatilization,

stabilization, transformation and destruction of contaminants."

Remediation of Contaminants

The mechanism of natural attenuation can be classified as destructive and non-destructive. Destructive processes include biodegradation and hydrolysis. Biodegradation is by far the most prevalent destructive mechanism. Biodegradation is a process in which naturally occurring microorganisms, such as yeast, fungi, and bacteria, break down target substances, such as fuels and chlorinated solvents, into less toxic or non-toxic substances. Certain microorganisms digest fuels or chlorinated solvents found in the subsurface environment. Non-destructive attenuation mechanisms include volatilization, sorption, dispersion and dilution. The last three generally being the most important.

Groundwater remediation is a complex process relying on the implementation of a variety of technologies to effectively degrade or remove the contamination. Remediation relies on the knowledge of the physical, chemical and hydrogeological properties of the subsurface. It is acknowledged, however, that it may not be practicable or feasible to fully restore the contaminated groundwater (US EPA, 1988). Active remediation may not be effective or feasible at widespread plumes, or because of hydrogeological constraints (e.g. fractured rock or karst geology), contaminant properties or the physical/chemical interaction of the contaminants in the subsurface. In these instances natural attenuation, end-user

(wellhead) treatment with monitoring or institutional controls may be the only feasible solutions for these sites.

Natural Attenuation Process

Natural attenuation is currently the favoured term applied to a multitude of *in situ* processes including decay (radioactive), biodegradation, chemical or biological stabilization, destruction, dilution, dispersion, sorption, transformation or volatilization. Natural attenuation processes typically occur at most contaminated sites but its effectiveness is controlled by the contaminants of concern, and the physical, chemical, biological and hydrogeological properties of the soil and groundwater. Natural attenuation processes are largely complex oxidation and reduction processes and under favourable conditions, reduce the risks to human health and the environment.

Role of Natural Attenuation in Remediation

The implication of this study and other similar studies (US EPA, 1999) is that the use of natural attenuation, as with any other remedial technology, must consider several key principles to ensure that the risks are managed or that the remedial objectives are achieved, including:

- 1. Control of Source Zones:** Engineering or hydrogeological remedial measures should be used to address source zones (e.g. phase separated hydrocarbons) wherever practicable. This may include containment of wastes (or by-products) where treatment is impracticable;
- 2. Restoration of Contaminated Groundwater:** Contaminated groundwater should be remediated

to its “beneficial use” wherever practicable, within a reasonable site-specific timeframe.

3. Mitigating Media Transfer of Contaminants:

Contaminated soil should be remediated to achieve an acceptable level of risk to human and environmental receptors, and to prevent any transfer of contaminants to other media (e.g. to surface water, groundwater, air, or sediments) that would present an unacceptable risk.

4. Risk Communication/Public Consultation:

Remedial actions, in general, should include opportunities for public involvement in the decision making process. This would serve to educate the interested parties, solicit feedback concerning the remedial process and provide greater confidence in remedial strategy in the protection of human and environmental health.

Advantages

Natural attenuation has a number of advantages as well as disadvantages. Each of these will need to be considered with respect to impact on various receptors and the sustainability and efficiency of the remedial efforts. Potential advantages for natural attenuation (and other *in situ* remediation alternatives) include:

- The generation of lower volumes of waste;
- Reduced potential for cross-media transfer or remobilization of contaminants;
- Reduced risk of exposure to contaminants, contaminated media (soil, air, liquid) and other safety

hazards;

- Reduced disturbance to ecological receptors;
- In situ* destruction of some contaminants;
- Less intrusive remedial works;
- Can be used as a broader application to treat more extensive plumes;
- Can be used with other remedial technologies;
- Monitoring can allow low cost enhancement of natural remedial processes;
- Potential lower remediation costs compared to active remediation, particularly in some instances where there is little or no energy input.

Future Prospects

While there is considerable debate among technical experts about the application of NA, for it to be chosen as a remedy there must be a significant amount of contaminant destruction. A remediation strategy that largely depends on physical mechanisms such as sorption, dilution and dispersion, is not attractive to most communities. Typically, at most sites contaminated with chlorinated solvents, perchloroethylene (PCE) and trichloroethylene (TCE) are the major threats. It is assumed that conventional clean-up of these chemicals through pump-and-treat systems will also remove co-contaminants. This may not be true with NA. In studying the natural attenuation of chlorinated solvents, other contaminants likely to be present in plumes, should also be included in the investigation and remedy selection.



NEWS AND VIEWS

WORLDWIDE TOLL OF TOBACCO

According to the Tobacco Atlas, published recently by World Lung Foundation and the American Cancer Society, six million people will die worldwide in 2010 due to tobacco consumption. 72% of these deaths will be in low and middle-income countries. Since 1960 global tobacco production has increased 300 per cent in low and middle-resource countries while dropping more than 50% in high-resource countries. Tobacco replaces potential food production on about 4 million hectares of the world agricultural land, equal to all of world's orange groves or banana plantations.

In developing countries, smokers spend great sums of money in proportion to their income that could otherwise be spent on food, healthcare and other necessities.

Tobacco consumption causes a 8500 billion hole in global economy. In India and China together, over half a billion men are consuming tobacco.

SHADY TREES REDUCE POWER BILLS

According to a study conducted by Prof. David Laband of the Auburn University School of Forestry and Wildlife Sciences, shady trees can reduce home owners, electricity bills during hot summer months and electricity usage and cost will be 11.4 percent less if a house has just 17.5 percent heavy shady coverage. He also noted that if one is having trees on the

west side of his house he will have a reduced power bill.

CLIMATE BENEFITS OF CHANGING DIET

Climate change mitigation policies tend to focus on the energy sector, while the livestock sector receives surprisingly little attention, despite the fact that it accounts for 18% of the greenhouse gas emissions and for 80% of total anthropogenic land use. Dutch scientists, in a research report published recently, explored the potential impact of dietary changes on achieving climate stabilization levels. They found a global food transition to less meat, or even a complete switch to plant-based protein food to have a dramatic effect on land use. Up to 2,700 Mha of pasture and 100 Mha of cropland could be abandoned, resulting in a large carbon uptake from re-growing vegetation. Additionally, methane and nitrous oxide emission would be reduced substantially. A global transition to a low meat-diet would reduce the mitigation costs to achieve a 450 ppm CO₂ stabilization target by about 50% in 2050. Dietary changes could therefore not only create substantial benefits for human health and global land use, but can also play an important role in future climate change mitigation policies.

Source: Elke Stehfest, Lex Bouwman, Detlef P. van Vuuren, Michel G. J. den Elzen, Bas Eickhout & Pavel Kabat (in *Climate Change Journal*)
E-mail: Elke.Stehfest@pbl.nl

DEADLY BLACK CARBON EMISSIONS FROM SHIPPING

International shipping represents a substantial and growing source of global greenhouse gas emissions. Shipping emission of carbon dioxide have recently been estimated at about 1.1 billion tons. This is about 3.5 per cent of global CO₂ emissions.

Shipping is also a substantial emitter of particulate matter, including black carbon or soot. Black carbon absorbs sunlight and is thus a potter climate forcing agent, especially when it is defrosted on snow and ice in regions such as Arctic, in the earth's snow and ice covered region, black carbon can reduce the reflectivity of surface ice and snow, thereby accelerating the ongoing melting process. The total warming impact of global impact carbon emission is estimated to be between 25 and 60 percent that of annual CO₂ emission.

TWO MORE GREENHOUSE GASES

Scientists have identified two new green house gases, nitrogen trifluoride, emitted by the electronic industry, and sulfuryl fluoride, used in pest control, which are accumulating in the atmosphere. Industry began using the two gases from the late 1990s, partly as alternatives to other greenhouse gases.

OBITUARY

Dr. Virendra Chandra, a member of ISEB and a former Senior Scientist of NBRI expired on 12 March in New Delhi. Dr. Chandra headed the Banthra Research Station of NBRI for a long time. He laid the foundation of alkaline land reclamation work at NBRI and made outstanding contributions in this area.



CONFERENCES

IPI-OUAT-IPNI International symposium on potassium role and benefits in improving nutrient management for food production, quality and reduced environmental damage

November 5-7, 2009; Bhubaneswar, India

Contact: Dr. D. Jena

Organizing Secretary, Department of Soil Science and Agricultural Chemistry, Orissa University of Agriculture & Technology, Bhubaneswar-751003, Orissa, India.

Email: dinabandhu_jena@yahoo.com;

www.ipipotash.org; www.ipni.net

Air Pollution 2009

Seventeenth International Conference on Modelling, Monitoring and Management of Air Pollution

20 - 22 July 2009; Tallinn, Estonia

Claire Shiell, Conference Secretariat, Air Pollution 2009

Wessex Institute of Technology, Ashurst Lodge, Ashurst Southampton, SO40 7AA, U.K.

Email: cshiell@wessex.ac.uk

http://www.wessex.ac.uk/air2009rem2.html

19th World Congress of Soil Science

"Soil Solutions for a Changing World"

1-6 August 2010; Brisbane, Australia

Contact: Congress Manager

19th World Congress of Soil Science, PO Box 177,

RED HILL QLD 4059, AUSTRALIA

E-mail soil@ccm.com.au

International Conference on Soil Fertility and Soil Productivity (SFE-SPRO), Two Features to be Distinguished - Differences of Efficiency of Soils for Land Uses, Expenditure and Returns -

March 17-20, 2010; Humboldt University, Berlin,

Germany Homepage: <http://www.uni-due.de/soil-fertility-productivity2010>

Contact: Prof. Dr. Wolfgang Burghardt, Soil Technology, University Duisburg-Essen/International Union of Soil Science (IUSS), Division 3 - Soil Use and Management
Email: soil-fertility-productivity2010@uni-due.de

International Workshop on:

Nanotechnology – Present Status and Future Prospects in Developing Countries

18-20 May 2009; Kashan, Iran,

Contact: Prof. Dr. Arun P. Kulshreshtha,

Director, Centre for Science & Technology of Non-Aligned and Other Developing Countries

(NAM S&T Centre), Core 6A, 2nd Floor,

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E-mail: namstct@gmail.com / apknam@gmail.com

Homepage: <http://www.namstct.org>



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P.O. Box 1139; Collingwood VIC 3066, Australia

E-mail: publishing.sales@csiro.au

www.publish.csiro.au/earlyalert

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The Science, Impacts and Solutions

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