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NESA

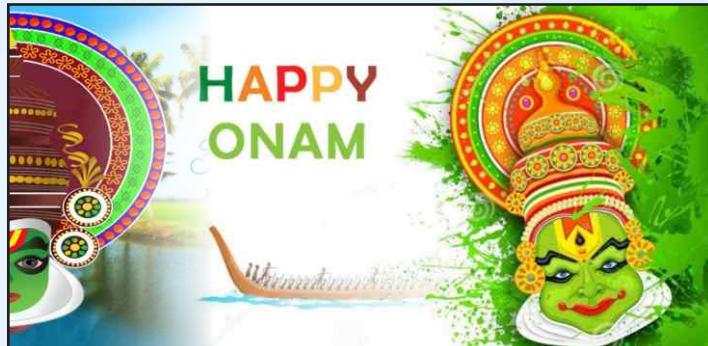
NATIONAL ENVIRONMENTAL SCIENCE ACADEMY

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August 2018



True independence
and freedom can
only exist in doing
what's right.



National Workshop on Impact on Global Warming: Ozone Layer (IGWOL 2018) on September 16, 2018

at Shiv Nadar University, NH91, Tehsil Dadri
Gautam Buddha Nagar, Greater Noida, Uttar Pradesh

Organized By

School of Natural Sciences, Shiv Nadar University, Dadri, U.P.
and

National Environment Science Academy (NEA), New Delhi

BROAD THEMES OF THE WORKSHOP

Keeping the theme and the tagline for the international ozone day, *Keep cool and carry on The Montreal Protocol*, the following themes are included in the workshop:

1. Ozone layer and its Impact on Global warming
2. Change in life style and their impact on environment protection
3. "Going Green" to create a sustainable earth.
4. Ways to protect Ozone layer

You may download the registration form from the website: www.nesa-india.org.

The registration form can also be requested from the organizing secretary. The completed registration form along with the proof of online transfer for registration fee should be send by email to:

Organizing Secretary
IGWOL2018

Email: igwol2018snu@gmail.com

NESA Award 2018 Notification No. 1

APPLICATIONS ARE INVITED

FOR THE NESA AWARDS 2018

LAST DATE 30th SEPTEMBER 2018

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ESSENTIAL

Professors/Scientist F and above

1. Research/Teaching experience of 15 Years or more.
2. Accomplished Research Work
3. Research publications in Journals with good impact factor.

DESIRABLE

1. At least 10 publications in journals with impact factor 3 or more.
2. Patents granted/Technology developed
3. Any award / recognition at National level.

AGE

45 and above.

The recipients shall get Citation, Certificate, Memento and a Gold plated medal, and can suffix F.N.E.S.A. after their names.

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2. Patents granted/Technology developed
3. Any award / recognition at National level.

AGE

40 and above.

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ESSENTIAL

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1. At least 10 publications in journals with impact factor 1 or more with proven record of achievement in that year.
2. Any award / recognition at National level.

AGE

35 and above.

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ESSENTIAL

1. Associate Professors/Scientists/Professionals with significant contribution in the field of environment.

DESIRABLE

1. Any award / recognition in the area of environment at national level.

AGE

Up to 35 and above

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ESSENTIAL

1. Scientists/Academicians/Social workers
2. Accomplished Research Work

DESIRABLE

1. Innovation in the area of green technology.

AGE

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ESSENTIAL

Assistant Professor/Research Associate/Research Fellows/any other PDF.

DESIRABLE

Active involvement in research with proven track record.

AGE : Up to 35.

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The application forms could be downloaded from www.nesa-india.org

Separate application form should be submitted for separate awards.

The application forms are non-transferable and it can also be obtained by sending a bank draft of Rs. 1000-00 / \$40 only (per form). Drawn in favour of NATIONAL ENVIRONMENTAL SCIENCE ACADEMY payable at NEW DELHI.

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206, Raj Tower-1, Alaknanda Community Centre,
NEW DELHI-110019 (INDIA) Tel.: 011-2602 3614

E-mail: nesapub@yahoo.co.in; nesapublications@gmail.com

Website: www.nesa-india.org

BIOSENSORS FOR AGRICULTURE AND ENVIRONMENTAL MONITORING

Monika Kundu*, Pragati Pramanik and Prameela Krishnan

Division of Agricultural Physics, ICAR-Indian Agricultural Research Institute, New Delhi -110 012

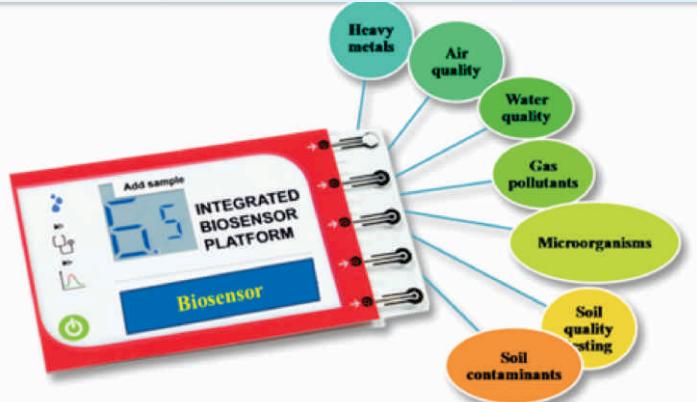
*Email: mkkundu07@gmail.com

A biosensor is an analytical device which converts a biological response into an electrical signal. It consists of a biological material, recognition molecules, and a transducer. The resulting electrical signal from a biosensor is proportional to the concentration of analyte. Biosensors are becoming important in a wide range of analysis. Miniaturization, reduced cost and the improved processing power of modern microelectronics has further increased the analytical capabilities of such devices, and given them access to a wider range of applications. Agricultural sector is not untouched with biosensor technology. The major application areas of biosensor in agriculture are soil quality testing, food quality analysis, disease detection in plants, water quality testing, pesticide residue detection and environmental monitoring. Biosensors can be classified according to their transduction principle such as optical (including optical fibre and surface plasmon resonance biosensors), electrochemical (including amperometric, and impedance biosensors), and piezoelectric (including quartz crystal microbalance biosensors). For the sustainable development of society, problems of environmental pollution need an immediate attention and our research efforts should be directed towards construction of biosensors for environmental monitoring of pollutants, toxic elements, and pathogens. Conventional methods include various biochemical methods and chromatographic techniques are time-consuming, and require sample pre-treatment and expensive reagents. Thus, more sensitive, cost-effective, rapid, easy to operate, and portable biosensing devices are urgently needed to monitor such pollutants responsible for adverse effects on ecosystems.

In this direction, the role of nanotechnology on the development of fast and smart biosensing devices is also crucial for successful detection possible pollutants. The majority of recent biosensors include nanomaterials and their nanocomposites for the improvement of analytical performance. For example, gold nanostructures could be a promising and versatile platform for

enzyme immobilization matrix due to their high surface area and good electrical conductivity. Biosensors are found to be very useful to detect the pollutants, contaminants and pesticide residues in air, water and soil. Biosensors for the detection of metal ions in air and water primarily use enzymes as recognition elements. Such biosensor can determine the heavy metals based on the concentration of metal ions on the biosensor due to adsorption. There are other indicators such as change in pH, colour, current signal, impedance etc. reflecting the presence of contaminant. Pesticides detection in air has attracted the greatest interest for environmental biosensors. This is because pesticides typically function by means of interacting with a specific biochemical target either as a substrate or as inhibitors. Due to their unique characteristic features and flexibility, biosensors show great promise for agricultural food safety and environmental monitoring applications. Day to day advances in food processing demands quick and smart testing devices for on-site testing of quality.

Biosensors in present scenario are certainly enhancing standards of quality life. There is a need for the commercialization of biosensors in the food and the agricultural industries. All food processing industries and environmental agencies are potential stakeholders for quick, easy and reliable biosensor devices. Biosensors with fast response time and reusable features will be more popular among the users for real-time testing of pathogens, contaminants and chemicals. Due to the global concern on agricultural quality and safety along with environment protection, the demand for rapid detecting biosensors will be ever increasing.



PLANTATION DRIVE BY THE ACADEMY

The Academy Members are requested that whenever they plant a tree on their birthday or any other event, please send us the photographs with report so we can publish the same in our newsletter. This will inspire and encourage many more life members of the Academy to participate in the "Green drive" of the Academy.

Members are also requested to preferably plant a medicinal plant which can benefit each and every one around us. Also they can form a committee in their RWA for plantation of tree on weekends.

Dr. Shefali Gola
Editor, NESA E-newsletter

IMPORTANCE OF MOBILE APP. FOR AGRICULTURAL DEVELOPMENT

Meenakshi Malik¹, Neelam Mehta¹, Nimisha Sharma² and Devraj³

¹ICAR-National Research Centre for Integrated Pest Management, New Delhi-110012

²ICAR-IARI, Division of Fruits & Horticultural Technology, New Delhi-100012

³Indian Institute of Pulses Research, Kanpur-208024 (U.P.)
E-mail: minaxi.2007@gmail.com

Agriculture, along with fisheries and forestry, is one of the largest contributors to the Gross Domestic Product (GDP) in India and Information is a key component in improving smallholder agricultural production and linkages to remunerative markets which thus improves rural livelihoods, food security and national economies. Nowadays agricultural stakeholders have a huge amount of heterogeneous and complex information ranging from cultivation techniques to product prices. In such situations use of mobiles and potential of mobile apps support them by providing access to information, markets and services. Phone usage is accompanied by positive outcome and has opened multiple opportunities like strong collective action among social groups for effective natural resource management. The dynamics of using phone among farmers is an effective way of linking them to market outlets and other service providers. The dynamic and diverse growth of mobile communication technology is creating opportunities for economic growth, social empowerment and grassroots innovation in the developing countries.

One of the areas with the greatest potential impact in today's generation is the contribution that mobile applications can make in the agricultural field. The use of these mobile apps depends on the interest and willingness of users to use in their day to day activities and the group of people that are using these applications. The successful spread of mobile apps requires the active involvement of public agencies and ministries. An increasing number of startups and tech companies are teaming up with the government to introduce mobile apps for farmers in India. The government along with various companies and NGOs have introduced mobile applications for farmers that provide real-time data about weather, local markets, seeds, fertilizers among other things. In addition, farmers can also interact and get guidance from agriculture experts across the country via respect to these apps. Given the vital role played by agriculture in the country's economy with over 58% of rural households depending on agriculture as their principal means of livelihood, this trend will help farmers make informed decisions and help increase agricultural produce.



With a pickup in the Internet usage and increase in smartphone usage, farmers have been able to make use of the Internet to research on

farming solutions. These next generation farming apps are being adopted by farmers in India to overcome various issues which will enable them to make informed farming decisions, ultimately impacting their yield and profit. With Internet connectivity getting affordable by the day and the reach expanding to even the remotest areas of the country, these apps will witness widespread

adoption in the coming years thus boosting the agriculture sector.

Initially, mobile apps were developed for undertaking basic tasks of computer programs, such as email, web browsing, calendar, contacts, weather forecast etc. But today, the growing demand for new mobile products and services puts pressure on both businesses and organizations to develop mobile apps for commerce, banking, health and tourism in order to meet specific needs of various business sectors. The agricultural sector in particular comprises an important pillar of the economy and as a business sector covers the food needs of the world population. However, the development of mobile apps for agriculture compared with other business sectors is limited. Firstly, it describes the global mobile agricultural apps ecosystem through a number of characteristics. Secondly, it focuses on the Greek mobile agricultural apps ecosystem and studies agricultural stakeholders' interest and willingness to use mobile apps in their daily agricultural activities. The empirical research shows that a very small number of apps is available in relation to the significance of agriculture worldwide. Finally, the development of mobile apps should support agricultural activities by providing accurate, certified and validated content and services that would take into account the peculiarities of geographical areas. M-apps are software designed to take advantage of mobile technology and can be developed for technology besides mobile phones. But mobile phones have many key advantages such as affordability, wide ownership, voice communications and instant and convenient service delivery. As a result, there has been a global explosion in the number of m-apps, facilitated by the rapid evolution of mobile networks and by the increasing functions and falling prices of mobile handsets. In the context of this work, the term "mobile agricultural apps" is used to characterize any mobile app targeting to the needs of the agricultural sector and its stakeholders, such as farmers, agricultural businesses and cooperation's. There have been many apps designed for agriculture which are showing a change in Indian agriculture.

AgriMarket Mobile App. developed by CDAC Mumbai automatically captures the location of a person who is using mobile GPS and fetches the market price of crops in those markets which falls within the range of 50 km.

The SmartAgri Mobile App developed by Vijayaragavan Viswanathan, a scientist with the European Organization for Nuclear Research, communicates with underground sensors to deliver easy-to-understand data, such as soil moisture and mineral level to farmer's mobile devices.

The RainbowAgri Mobile App. is developed by Jayalaxmi Agro Tech to equip farmers with crop-specific information using audiovisual tools. Mandi Trades lists government crop price updates, important information for farmers in remote villages and the App. connects local buyers and sellers.

The Pusa krishi Mobile App. is developed by ZTM&BPD Unit, ICAR-IARI, New Delhi and strives to be a strong link between the research community and the outside world. It promotes Agribusiness Ventures through technology development and commercialization for everyone from a corporate to an individual farmer and have a variety of technologies/products for commercialization.

A Mobile App Info-equine developed by the ICAR-National Research Centre on Equines, Hisar is a user-friendly bilingual application developed in Hindi and English language for equine owners, Veterinary officers, Animal Health department officials, students, industry professionals and other stakeholders. This App

allows users to enhance their knowledge in various aspects of equines with regard to breed, management, nutrition, diseases, artificial insemination, pregnancy diagnosis etc. Besides the general information about equines, the information about diagnostic services, artificial insemination services, provision of semen for production of best quality of mules, horses and donkey and technologies developed by the Centre is also provided in the app.

The Mobile App riceXpert is developed for the farmers to provide information to farmers in real time on insect pests, nutrients, weeds, nematodes and disease-related problems, rice varieties for different ecologies, farm implements for different field and post harvest operations by ICAR-National Rice Research Institute (NRRI), Cuttack.

The app is a web-based application system which facilitates flow of information from the farmer to the farm scientist and gets their instant solution. Farmers can use this as a diagnostic tool in their rice fields and make customize queries for quick solution of their problems through text, picture and voice that would

be addressed by NRRI experts on real time basis. This APP may also be a very useful tool for the researchers, students and village level workers (VLWs) working on rice crop in different states as

well as in the country.

The Mobile App Salinity Expert is developed by ICAR-Central Soil Salinity Research Institute, Karnal is a Knowledge based digital compendium including



management practices for rice, wheat and mustard crops under salty environments right from sowing to harvesting and is User friendly query handler to raise queries either as text messages or in graphic/recorded form. The queries are attended by the administrator via message sorting, short message service, email etc. Updated agro-advisories and information pertaining to training programmes and other important events are sent to the concerned.

The increase in mobile apps catering to the agriculture sector would, in the long run, not only increase bottom-lines but help the rural masses bridge the digital divide and use technology to grow their agriculture-based businesses.

National Conference on Chemistry for Human Health and Environment (CHHE) *Theme: Designing Chemistry for a Sustainable Tomorrow*

Submit Abstract: gnc.chem.du@gmail.com

15-16 December 2018

Venue: Conference Center, University of Delhi, Delhi-110007

Conference Highlights

(Sub-themes)

- Earth Sciences
- Environmental Chemistry and Engineering
- Environmental Biotechnology
- Pollution Control Chemistry and Green Chemistry
- Environmental Toxicology and Mutagenicity
- Energy and Environment
- Applications of Environmental Chemistry
- Designing Chemistry for a Sustainable Tomorrow
- Plant Chemistry
- Agricultural Chemistry
- Environmental Design
- Environmental Hazards
- Environmental Biology
- Environmental Sciences



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Registration begins from
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Co-ordinator, GCNC
Department of Chemistry
University of Delhi, Delhi-110007.
Contact No.: 9958313101
E-mail: rksbarmagreenchem@botmail.com



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SNOW LEOPARDS IN PERIL

S. K. Basu

UFL, Lethbridge AB Canada

Email: saikat.basu@alumni.uleth.ca



Snow leopards constitute an important member of the cat family and a majestic mammal that survives at higher altitudes. Known to be one of the most elusive and shy member of the cat family is very rarely seen by people even in their natural habitats. Snow leopards have been reported to inhabit Southern Siberia (Russia), Mongolia, Central Asia (Kazakhstan, Tajikistan, Kyrgyzstan and Uzbekistan) and South Asia (Afghanistan, Pakistan, India, China, Nepal and Bhutan). Around 2 to 3 sub species of snow leopards are known; one in around Russia and Central Asia and the one in China and South Asia. There is however debates among the scientists regarding the exact number of sub species across Eurasia. The exact number of wild snow leopards is not known; however, it is assumed to be around 3,000 to 6,000 according to one group and around 4,000 to 8,000 according to another. But this is also debatable and not supported by field surveys conducted in their natural habitats. The actual number of wild snow leopards in the natural habitats could be much less.

In India, the species has been reported from the states of Jammu and Kashmir, Uttarakhand, Himachal Pradesh, Darjeeling (West Bengal), Sikkim and Arunachal Pradesh, covering a vast stretch from Western into Eastern Himalayas. The animal is reported to



reside in higher altitude areas in Afghanistan, Pakistan, Tibet, Nepal and Bhutan; and in comparatively lower altitudes of Central Asian countries, Mongolia and southern Siberia (Russia). The mammal had been designated as Vulnerable by IUCN with high chances of species decline in their natural habitats by 10-20% in the next 2-3 decades due to habitat fragmentation and habitat loss, degradation of forests, human encroachments into sensitive snow leopard ecosystems, poaching and wildlife trafficking, global warming and climate change.

Rapid deforestation in the mountainous regions of Russia, Mongolia, Central Asia and South Asia due to over exploitation, unplanned infrastructural developments, human encroachments into snow leopard habitats, soil erosion, over grazing by cattle and livestock raised and maintained by indigenous communities living adjacent to sensitive snow leopard habitats are having negative impacts on the population of this majestic mammal. Their breeding and hunting sites are degrading rapidly due to both anthropogenic and natural causes pushing the animal towards adjacent human habitations for survival and making them vulnerable to human hunting and poaching pressures across their entire range of distribution. Some reports have however suggested that there has been an increase in different snow leopard sub populations across the inaccessible and extremely remote mountainous areas of Afghanistan in the past two decades due to very little anthropogenic impacts. However, snow leopards sub species and different sub populations in Siberia (Russia), Mongolia, Central Asia, Tibet and Pakistan have been impacted by organized poaching of the majestic cat for its highly valued skin with unique patterns in the international wildlife black markets operating in parts of South East Asia and China.



Snow leopard populations in India, Nepal and Bhutan are more impacted by habitat degradation, lack of suitable prey base for the animal, grazing pressures and ecosystem degradation. Occasional encounter of the cat with cattle grazers in the high Himalayas have been also reported for some incidents of brutal killing of the animal by local villagers, cattle grazers and herdsman to save their herd animals from snow leopard predation. Furthermore, some researchers are also suggesting that global warming and climate change is also impacting the quality of snow leopard high altitude habitats and prey base; forcing the animal to move to lower altitudes in search of suitable prey and making them vulnerable to attacks and provocation by indigenous settlers, grazers and herdsman. Poaching and related crimes are also not uncommon.



However, the biggest challenge for successful snow leopard conservation in South Asia with particular reference to India is the fact that very little ground information is actually available and accessible by researchers for studying this rare and majestic high altitude cat. Even if some data is available they have been identified to be unreliable and low quality. Hence it is extremely important to collect reliable field data for snow leopards across their South Asian habitats. Till date, no reliable distribution map, habitat map, subpopulation distribution map for snow leopards is available for snow leopards in South Asia including India; that could provide strong information base for taking rigid measures of conservation for the vulnerable snow leopard sub populations. Although some impressive bold steps have been taken in India for captive breeding of snow leopards; but, unfortunately they are limited in both their scope and opportunities. Unless comprehensive conservation steps are taken by all the countries that have wild populations of snow leopards; very little is expected to save this majestic mammal. It is important to note that India is the only country in the world that hosts natural habitats for five major cat species in the world within the boundary of one nation; namely tiger, lion, leopard, snow leopard and clouded leopard.

Hence, it will be important to initiate a joint multi nation snow leopard conservation program under Joint Conservation Initiative

(JCI). Under this framework, participating countries like Russia, Mongolia, China and countries from Central and South Asia can join their coordinated efforts in successful snow leopard conservation. It could work like the international tiger and elephant conservation networks operating successfully among multiple nations. This can bridge the data gap on snow leopard distribution, migratory ranges and pathways, premier snow leopard habitats, different sub populations and sub species in a comprehensive fashion.

Participating countries can learn from one another regarding their success and failure in snow leopard conservation, challenges and opportunities, new strategies and methods of ground and aerial surveys of important and sensitive snow leopard habitats, snow leopard behavior, breeding cycles and hunting patterns, preferred prey species as well collect information as on the poaching and hunting pressures on the animal and conservative measures to protect this majestic cat effectively. Overall such an initiative can play an important role in conserving the majestic snow leopards and help revive their natural wild populations across their vast Eurasian range extending from Russia to India. The alarm bell is ringing and it is time for us to take the necessary measures to conserve this majestic and elusive cat in their high altitude habitats. **Acknowledgement:** Sikkim Express

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- (6) NESA YOUNG SCIENTIST AWARD**

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SUSTAINABLE DEVELOPMENT: MULTIPLE PERCEPTIONS AND UNLIMITED EXPECTATIONS

Dr. Deeksha Dave

Assistant Professor

Department of Environmental Studies, IGNOU-110068

E-mail: deekshadave@ignou.ac.in

Introduction

Life on Earth depends on a complex set of interactions primarily between human beings and nature. The dependence of man on economic system has come in the picture secondarily after the advent of industrialisation era. While making comfortable living conditions for self and the coming generation, unplanned, haphazard and unsustainable growth models have been adopted. Such development models have eroded the earth's natural capital, increased the frequency and extent of natural disasters and created a sharp line of divide between the rich and the poor. Such a kind of development is at the cost of the healthy future of coming generations. Responding to this, planners and policy makers have been increasingly using the phrase 'sustainable development' and have explained why it is important and how it can be achieved.

The voluminous literature that has grown up around the concept of Sustainable Development indicates, however, a lack of steadiness in its understanding and lack of consistency in its application. Many view it as a synonym of environment protection. The comprehensive nature of the concept makes it use wide although its current features contain major weaknesses. These include an incomplete perception of the problems of poverty and environmental degradation, and uncertainty about the role of economic growth and public participation. Due to these weaknesses there are inadequacies and contradictions in policy making in the area of international trade, agriculture, and energy.

The idea of sustainable development is not new but the way it is presented these days with bewildered strategies and the manner by which it aims to get implemented is totally directionless. The ease with which the term is used should not mean that it is a cakewalk possible anywhere. The discussions on sustainable development are more rhetoric and lack proper implementation guidelines. We hear about sustainable development, sustainable growth, sustainable economies, sustainable societies, and sustainable agriculture. What does sustainable mean in terms of sustainable development is still ambiguous. We are not sure as what is to be sustained: resources, human survival or development.

Meaning of Sustainable Development

Academically the term 'sustainable development' is given several

meanings. It must be understood that Sustainable development is a process and not a destination. It requires holistic attitude towards the planet where an individual is able to perceive the inter-relatedness of each other. The definition of the term arises from the very famous Brundtland Report called "Our Common Future" published in 1987. In April 1987, Gro Harlem Brundtland, former Norwegian Prime Minister, presented to the UN the result of the World Commission on Environment and Development she had been chairing for the past three years. It was a report, entitled "Our Common Future" which was written by 23 experts from 22 different countries. The report officially defined sustainable development for the first time as 'the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'

The meaning of sustainable development arises from the concept of needs and wants. Let us understand the difference between needs and wants. A need is something without which you can't live. For example food. If you don't eat, you won't be able to survive. Needs are understood as our physiological requirements like food, water and air without which survival is not possible. On the contrary, a want is something you would like to have. It is not absolutely necessary, but it would be a good thing to have. A good example is music. Wants are the psychological aspirations essential for our well being and generate happiness, comfort, well being, entertainment or social status.



make steps but otherwise it requires systemic thinking to conceptualise the interrelated challenges. It is as if sustainability can be plotted on the X-axis of a graph, and development on the Y-axis, then the line of best fit is 'Sustainable Development'. However, development is not a planned act; there is no magic stick or formula. Had it been true, then we should have been able to modify the earth as per our wish and needs. The reason for not been able to do so is that geography, biology, geology, and history of a place together play a part in the process.

There are three key points which have moved the idea of sustainable development to the present state:

Legitimate Aspiration of better life: Human beings aspire for better living conditions. It is evident from man's transition from a nomad to a settled farmer. There is no end to man's desire to be materialistic rich or to enjoy a comfortable living. In an endeavour in achieving all this and more and more every day, the constant availability of these takes a back seat. Human needs are never fully satisfied. They always want more and this desire never seems to end.

Limited Stock of resources: The availability of the resources on the planet is limited but human desires keep on increasing. The

fundamental observation in the society is that the earth does not have enough resources to produce everything that everyone wants. The resource scarcity leads to following implications:

- Limited Production: There cannot be indefinite production owing to limited resources available.

- Foregone Alternatives: One resource will produce only one good at a time.

- Sacrifice: Some people have to sacrifice the goods and services that they want or need.

- Opportunity Cost: Doing one thing, producing one good, performing one activity, means other things cannot be done, other goods cannot be produced, and other activities cannot be performed.

Increasing population: Demographic trends of the past as well as future predict that human population is continuously on the rise. With improvements in medicine and better health care facilities, the death rate has declined significantly over last several years. Further, the growing consumerism grows the psychological needs of the people. Combined effect of mass production and widespread consumerism has accelerated the pace of natural resources depletion.

Sustainable Development at the Cross Roads

The chief objective of development and sustainability is about maintaining peace and harmony among fellow human beings. In spite of stringent efforts on the part of the government and scientific institutions, the progress made in the direction of sustainable development is not satisfactory. Current models of development and patterns of production and consumption are doing harm to natural environment. A large mass of land is degraded, forest cover has reduced considerably, rivers and lakes are extremely polluted and biodiversity on the planet is continuously at the risk of survival. The frequency of natural disasters has increased and is likely to intensify further. In that case, Environmental sustainability is out of question. People living on the coastal areas are under threat because of increase in seal level caused by global warming. .

Due to income disparities there is unequal access to scarce and valued resources. This makes social sustainability also at stake. Inspite of the progress made in achieving Millennium Development Goals, still there are uneven results. Lower income groups and backward sections of the society remain poor and are deprived of basic services of education, employment and health care. As the MDG deadline approaches, around 1 billion people still live on less than \$1.25 a day - the World Bank measure on poverty - and more than 800 million people do not have enough food to eat. Women are still fighting hard for their rights, and millions of girl child are missing. To help guide the future course of economic and social development on the planet, Sustainable Development Goals (SDGs) are proposed. At Rio+20 - the UN Conference on Sustainable Development - countries agreed to establish an intergovernmental process to develop a set of "action-oriented, concise and easy to communicate" Sustainable Development Goals (SDGs) to help drive the implementation of sustainable development.

However, the ideas of sustainable development cannot be put into practice unless democracy is made the larger part of conversation. Sustainable development - in both senses - doesn't occur just by accident. It implies give and take and sometimes for the petty interests the larger whole is sacrificed. If India has to lift its poor

from poverty and bring it to the level of the people of the developed nations, it has to do so will do so by burning less carbon per person in the long run than they did. It will be guided by less use of materials and being less extravagant.

Adam Smith laid out 250 years ago that industries grow and disappear by innovation, substitution and efficiency, and that the same rules essentially apply to nations too. It means that all industries, and nations, will face scarcity of supply unless innovation, substitution or efficiency intervenes. In view of this, sustainable development remains at the cross roads where economic progress means goodwill and fortune to only a small percentage where the maximum are denied the fruits of development. Nearly a quarter of the children in developing countries is underweight and dies before completing their fifth birthday. Disparities between rural and urban living is widening like never before. Similarly gender based discriminations and inequalities persist in rural as well as urban societies. With the growth of urbanization, the development challenges of the future will wear an urban face. According to World Bank, as of 2010, the majority of the world's population was living in cities. Increasing poverty, poor health conditions, lack of education, increased environment risks all go together and have to be dealt taking a holistic approach. The cost of environment degradation and social inequalities are born mainly by the poor whose livelihood and survival depend upon the natural resources in their vicinity.

'Sustainable growth' itself appears like an oxymoron because growth cannot be sustained forever on a planet with finite natural resources. In order to take serious steps some actions need to be taken on priority basis. Some of the measures include; reorient each economic sector with sustainability as a core criterion, build in continuous environmental monitoring and feedback mechanisms for every development project, empower citizens to play active role in decisions relating to development, specific indicators like per capita availability of clean air and water need to be measured, improve the quality of natural ecosystem and carry out environmental and social impact assessments for public and private sectors.

To be truly sustainable development requires resolving the basic issues of poverty, maintenance of sanitation standards and protection of environment. 'Sustainable Development', which is seen as the basis for a Post-2015 development framework, has devolved from an important idea to catch-all ordinariness. Due to its unstructured and unguided ideas, it has become an overly-politicised issue. It is common belief that all good things go together and sustainable development brings uniformity and makes people earn a decent living. Healthy rate of growth which if unmet leads to poverty and when exceeded leads to environmental and social harm. (Alastair Roderick, 2013)

The Confronting Challenges

One of the most striking characteristics of the term "sustainable development" is that it means goodwill to all people. To others "sustainable development" is an alibi rather than guidance for proper action. For many, sustainable development can be viewed as a social movement "a group of people with a common ideology who try together to achieve certain general goals."(Kates et al, 2005). Social face in itself poses a lot of complex problems. Social changes and other social phenomena are difficult to quantify.

Another critical argument was related to the de facto dominance of environmentally centred actors in the work. These critical voices demanded more emphasis on the economic and social "pillars" of the concept. More recently it has been argued that the political

acceptability of sustainable development depends on its capacity to respond to a country's persistent social problems. It has also been noted that the economic "pillar" has to be integrated in the concept as a whole and not be seen as an independent part. However, the term does not give any guidance on how to judge between the unavoidably conflicting objectives of economic rationality/profitability, social justice and ecological equilibrium. (UNECE, 2005)

Despite the cloud of ambiguity hanging over the concept of sustainable development, the international community has continued using it. The concept has been seen as inclusive and operational enough to make meaningful action in pursuit of sustainable development wherever possible.

The Brundtland report argued that the vast and complex issue of environmental deterioration should be integrated with the equally vast and complex issue of human development and poverty, clearly suggesting that both challenges needed to be resolved simultaneously and in a mutually reinforcing way (Robinson, 2004). The report was radical in stating that ecological sustainability cannot be achieved if the problem of poverty is not addressed globally, but was reformist in its emphasis on growth. Sustainable development came to be formulated as a different kind of growth, one that is not harmful to the environment, bringing worldwide wealth and health. In this meaning, sustainable development is about conservation rather than preservation. Sustainable development is pro growth and this is why people favouring value change and lifestyle change prefer the term "sustainability."

Sustainable Development is being criticised in environmental and development circles. Neither it is bringing economy to a rise nor does it fulfil the poverty reduction targets. Unsustainable development is a kind of conscious decision made by the rapidly developing countries to eradicate poverty by extracting natural resources much above their capacity so that at the end everything comes to halt. Natural energy resources should be considered common property, and in order to make development meaningful and sustainable should remain so. Planned development of the national capability is an essential precondition to maximise the potential use of natural resources. In the context of Bangladesh, a ban on exporting mineral resources and open-pit mining is also necessary to ensure energy security and sustainable development. It concludes that energy-sovereignty is the key to energy security, and therefore to sustainable development.

Sustainable Development: End or Means??

Despite two decades of research on sustainable development, there is still a controversy over the various dimensions and components of sustainable development. Some scholars and experts emphasize "economic" sustainability that focuses on the implications of development activities for environmental costs. Some of them stress "environmental" sustainability that prescribes the realization of development in line with biotic capacity and resource constraints; others draw attention to "social" sustainability that supports people's active involvement in managing environment and development (Estes, 1993; Reed, 1996; Haque, 1999b). However, these major economic, social, and environmental dimensions of sustainable development are mutually complementary rather than exclusive. For instance, in pursuing development, the environmental costs have to be considered ensuring that it does not put excessive pressure on environment. Equally important in this regard is the active participation of the people. In addition, there are cultural and attitudinal dimensions of sustainable development, including people's lifestyles and consumption patterns that also affect

environmental resources and conditions. Modern lifestyle based on endless consumerism that has expanded worldwide in the current age of globalization is a major threat to sustainable development. Thus, in both theory and practice of sustainable development, it is crucial to understand its multidimensional nature.

In light of all this, one is compelled to wonder whether the current model for international institutions, established in the wake of World War II, is adequate for building a sustainable world. Transferring technologies to and building capacities in countries throughout the world to contribute adequately to sustainable development is a difficult task.

Within a few years, a majority of the world's people will, for the first time, be living in cities (J. Lash, 2001). In order to build a sustainable world for the future, it will be necessary first to develop better models for cities, taking into account the multidimensional contributions of science and engineering, politics and social sciences, and many other fields for designing the improved cities of the future. On the other hand, it will be necessary to strengthen the rights and empower the rural communities to provide them access to the information that they so obviously require. Clearly, a small minority of Earth's residents cannot continue to consume such a large majority of its productivity. As Ismail Serageldin has put it, "a world divided cannot stand; humanity cannot survive partly rich and mostly poor." (J.B.Schor, 1998)

Population, overconsumption and the use of appropriate technology must all be brought into the equation to achieve a sustainable world. Nothing less than a new industrial revolution and an ever green agriculture are required to make that world possible. Many of the world's life-support systems are declining rapidly and visibly, and it is clear that in the future Earth will become less diverse, less resilient, and less exciting than it is now.

The Future We Want

Issues such as Food crisis, ecological crisis, water crisis, energy crisis and the like cannot be dealt separately and a global viewpoint is needed to mitigate such problems. The earth is witnessing dramatic change in its composition and economic activity. Tremendous population growth is making life difficult on the planet. According to UN Projections, the world population may stabilize at between 8 and 14 billion in the next century. With the same pace, the industrial activity too is increasingly extracting raw material from forests, oceans and land. Highest level of investment is seen in infrastructure building, transportation and agriculture modernisation. Humans are entitled to a quality of life which is available to coming generations as well. Sustainable development gives a hope to balance the needs and wants of individuals living on the planet. However, there is limitation imposed on the sustainable agenda due to technological and social constraints. However, science and technology can be used to pave way for further economic growth. Evils prevailing in society like poverty and unemployment need to be addressed. Poverty is not a sin and goals of sustainable development are to fulfil the basic needs of the masses. In order to provide equal share to the poor needs political transformation of the system also. Effective citizen participation and transparency is needed to improve decision making in matters related to this.

An effective strategy would be to motivate the affluent class to adopt an ecofriendly lifestyle to make it more sustainable. It must be understood that sustainable development is not a destination or final stage of accomplishment rather it a means to modify the way the resources are extracted, the investments are made or

technological intervention enter into our day to day lives. The process is not so simple or undemanding. It needs an obvious change in the way the businesses are done. The need is to adopt appropriate policies which are more sustainable in terms of environment protection and conservation of vital earth's resources. Economic policies have also to be environmentally friendly policies to determine future growth trajectory. However, the future is conditional on decisive political action now to begin managing environmental resources to ensure both sustainable human progress and human survival. This is a wakeup call that it is already very late to take immediate decisions to secure the earth's resources. There is no detailed blue print for action but by enlarging people's cooperation the necessary changes can be brought.

Sustainable Development requires reflexivity in the sense that there must be continuous assessment and adaptation taking place. Unplanned town planning has created inhospitable places for humans to live and interact. Scientific forestry practices have resulted in reduced timber production because of increased vulnerability to disease and weather (Scott, 1998). In a German Development Institute briefing paper it was suggested that the post-2015 international agenda could be structured into two parts comprising of human development objectives (final goals) and provision of global public goods (instrumental goals). It was proposed that the "final goals" could include reduction of income poverty, food security, education, health and family planning, infrastructure (energy, housing, water and sanitation), environment (clean air and water, protection of resources), resilience (human and social security), and good governance, while the "instrumental goals" could include limiting climate change, joint global management of environmental resources, containing infectious diseases, improving the stability of financial markets, curbing international terrorism and disarmament of anti-personnel mines and weapons of mass destruction . As the Millennium Development Goals deadline approaches, the world is moving on to the next big target, it is clear that there is no 'the end' in history. Sustainability can ensure happy living conditions forever provided the corrective measures and sound decisions are taken today.

Conclusion

An important conclusion is that sustainable development is a process, not an end in itself. It also implies that dialogue must be established between members of the community and equal participation from all is a prerequisite for sustainable development. Developing countries are united by similar characteristics, challenges and opportunities which are different from that of the developed countries. All the sustainable development discourses and deliberations have to keep this central idea in mind.

Thus, sustainable development needs democratic thinking, but it can also help strengthen democratic institutions through consensus-based public participation. The growing concern with ``sustainable development" reflects a basic belief that the interests of future generations should receive the same kind of attention that those in the present generation get.

We have no right to abuse or plunder the available common natural assets debarring the opportunity to the future generations to use them as well. We have no right to violate the rights of coming generations. It would be unfair to believe that in order to safeguard the opportunities for future generations, the current less privileged sections of the society are neglected and exploited. The living standard of a class of society has been raised beyond limits and that section is living a life with fewer miseries and more

comforts. However, there are still the unfortunate population groups characterised by high infant mortality, poverty, illiteracy, etc.

Sustainability postulates living in one's own means. Earth being a closed system it is difficult to believe to have sustainable growth in a sustainable world. We agree to the preposition that everyone should have access to fair shares of food, water, shelter, and health care but to make it happen it is necessary to enable future societies to make choices for themselves. To materialise the idea of sustainable development, we need to re-examine the meanings of the terms like growth, standard of living, etc in the context of sustainability. At one end, sustainable development is constrained by the availability of natural resources and at the other hand, it is terminated by excess material input like pollution, scarcity, etc. For those living at subsistence level, to consume is to survive. This is true today for about a third of the world's human population. For them, amenities beyond survival are largely luxury. It is correct to point that attaining sustainable development depends largely on the individual choices that we make. How we live and how we act makes much difference towards the availability of resources to the coming generations. Sustainable development is the only viable path for development, and, therefore, that for development to be effective it must be sustainable and beyond the short term sectoral planning holistic viewpoint needs to be strengthened.

References

- Alastair Roderick (2013) "A Modest Case for Unsustainable Development", The Huffington. http://www.huffingtonpost.co.uk/alastair-roderick/a-modest-case-for-unsustainable-development_b_3778763.html
- Anu Muhammad, (2014) "Natural Resources and Energy Security "Challenging the Resource-Curse Model in Bangladesh" Economic and Political Weekly, Vol - XLIX No. 4.
- Haque, (M.S. 1999) b. "Restructuring Development Theories and Policies: A Critical Study" Albany: State University of New York Press.
- J. Lash, Science 294, 1789 (2001). Cross.Ref.Medline Science Google
- J. B. Schor, (1998): "The Overspent American: Why We Want What We Don't Need" HarperCollins, New York.
- John Robinson (2004): "Squaring the circle? Some thoughts on the idea of sustainable development", Ecological Economics 48.
- Loewe, M. (2012): "Post 2015: How to reconcile the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs)", Bonn: DIE (Briefing Paper 18/2012)
- Perkins R (2013): "Sustainable development and the making and unmaking of a developing world" Environment and Planning C: Government and Policy 31(6) 1003 – 102
- Reed, D (1996.): "Structural Adjustment, the Environment, and Sustainable Development". London: Earthscan.
- Robert W. Kates, Thomas M. Parris, and Anthony A. Leiserowitz, (2005): "What is Sustainable Development? Goals, indicators, Values and Practice," Environment: Science and Policy for Sustainable Development, Volume 47, Number 3, pages 8–21.
- United Nations Economic Commission for Europe (UNECE) http://www.unece.org/oes/nutshell/2004-2005/focus_sustainable_development.htm

EVENT / CONFERENCES

Following are the details of some important conferences:

1. IASTEM- 440th International Conference on Environment and Natural Science (ICENS) on 15th - 16th August, 2018 at New Delhi, India <http://iastem.org/Conference2018/India/3/ICENS/>
2. The ASAR-International Conference on Renewable Energy, Green technology & Environmental Science (ICREGTES) Organized By: The ASAR on 1st September 2018 at Chandigarh, Punjab, India. <http://www.asar.org.in/Conference2018/9/Chandigarh/ICREGTES/>
3. ieee forum-International Conference on Nanotechnology, Renewable Materials Engineering & Environmental Engineering (ICNRMEEE) at Madurai, Tamil Nadu, India on 2nd September, 2018 <http://ieeeforum-conference.com/Conference2018/9/Madurai/ICNRMEEE/>
4. IASTEM- 460th International Conference on Environment and Natural Science (ICENS) at London, United Kingdom on 18th - 19th September, 2018. <http://iastem.org/Conference2018/UK/5/ICENS/>
5. International Symposium on Recent Trends in Agriculture, Biodiversity and Social Sustainability (ABSS 2018). 30th September & 1st October , 2018 at Botanical Survey of India (BSI) Auditorium, Chetham Lines, Allahabad, U.P., India. <http://prayagsangam.org/gdcsaidabad.org>
6. ISER-448th International Conference on Chemical and Environmental Science (ICCES) at Hamilton, Hamilton, New Zealand 6th - 7th October , 2018. <http://iser.co/Conference2018/NewZealand/5/ICCES/>
7. International Conference on Advances in Agricultural, Biological and Applied Sciences for Sustainable Future on 20th - 22nd October, 2018 at Moot Court Conference Hall, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh, India. <http://agriinventionjournal.com>
8. National Conference on Chemistry for Human Health and Environment (CHHE) on 15th - 16th December, 2018 at Conference Center University of Delhi, Delhi 110007. <http://greenchem.du.ac.in/www.nesa-india.org>

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Dr. Shefali Gola
Editor, NESA E-newsletter

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206 Raj Tower -1, Alaknanda Community Centre,
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E-mails: nesapublications@gmail.com; nesapub@yahoo.co.in

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For further details and **NOTES FOR AUTHORS**,
please contact Academy at
nesapublications@gmail.com
nesapub@yahoo.co.in