WORLD ENVIRONMENT DAY - 2018 THEME

BEAT PLASTIC POLLUTION

प्लास्टिक प्रदूषण पर रोक लगाएं

NATIONAL CONFERENCE on

ENVIRONMENTAL CHALLENGES FOR 'NEW INDIA'

2nd - 3rd June, 2018

at

Dr. Bhim Rao Ambedkar College, University of Delhi, Delhi

SOUVENIR & ABSTRACTS

Organized by

Environment and Social Development Association (ESDA), Delhi

In collaboration with

Dr. Bhim Rao Ambedkar College, University of Delhi

CSIR-National Environmental Engineering Research Institute, Delhi

and

National Environmental Science Academy (NESA), Delhi

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2-3 June, 2018

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Organised by: ESDA, BRAC-DU, CSIR-NEERI & NESA

SOUVENIR & ABSTRACTS BOOK

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Messages

The Hon'ble Vice President of India is happy to learn that Dr. Bhim Rao Ambedkar College, University of Delhi in association with CSIR-National Environmental Engineering Research Institute (NEERI), Environment and Social Development Association (ESDA) & National Environmental Science Academy is organizing a National Conference on **Environmental Challenges for 'New India'** on June 2 – 3, 2018.

The Vice President extends his greetings and congratulation to the organizers and the participants and wishes the event all success.

28/5/2018

(N. YUVARAJ)

New Delhi
28th May, 2018.

ज्ञान-विज्ञान विमुक्तये
प्रो॰ धीरेन्द्र पाल सिंह
अध्यक्ष
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Date: 27.05.2018

Messages

I am pleased to know that Dr. Bhim Rao Ambedkar College, Delhi, on the special occasion of World Environment Day - 2018, is organising a two day National Conference on ***Environmental Challenges for 'New India'*** in collaboration with CSIR-National Environmental Engineering Research Institute, Environment and Social Development Association and National Environmental Science Academy on 2nd & 3rd June, 2018.

The conference aims to foster interactive discussions among academicians, scientists, corporates, policy-makers, civil society, students and all other nature-lovers and to convince the various stakeholders about the importance and need for a "safe and healthy living and working space" for the people of India to take on environmental challenges. It will also attempt to present some viable working solutions to the environmental challenges being faced by the emerging "New India" and its people in the global development context. Hence, the topic chosen for the Conference is most appropriate in the present day scenario.

I extend my best wishes to the Organizers of the Conference as well as to the participants.

D P Singh

(Prof. D.P. Singh)

25th May, 2018

वल्लभभाई पटेल चैस्ट इन्स्टीट्यूट
VALLABHBHAI PATEL CHEST INSTITUTE
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Messages

I am glad to know that Environment and Social Development Association (ESDA) is organizing a **National Conference on Environmental Challenges for 'New India'** in collaboration with Dr. Bhim Rao Ambedkar College (University of Delhi), CSIR-National Environmental Engineering Research Institute (NEERI) and National Environmental Science Academy (NESA) on the special occasion of World Environment Day – 2018 on 2nd – 3rd June, 2018.

As we are all aware that pollution, climate change, deforestation and urbanization are some of the most important global challenges in today's world. Solutions are needed to tackle these pressing problems in order to ensure sustainable development and conserving resources for the future generations. India cannot afford to lag behind other countries in addressing these pressing issues. I am sure that this National Conference would provide a good platform for meaningful deliberations between all the stakeholders so that some viable solutions could be sought out for the policy makers at international, national and regional levels.

I would like to congratulate all the organizing committee members, Chairman, Governing Body and Principal of Dr. Bhim Rao Ambedkar College, Director of NEERI, President of ESDA and President of NESA for organizing this conference.

I wish the Conference a great success.

(Prof. Raj Kumar)

सी.एस.आई.आर. - राष्ट्रीय पर्यावरण अभियांत्रिकी अनुसंधान संस्थान
CSIR - National Environmental Engineering Research Institute
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद् / Council of Scientific & Industrial Research)
NEERI

(वैज्ञानिक तथा औद्योगिक अनुसंधान विभाग, विज्ञान एवं प्रौद्योगिकी मंत्रालय, भारत सरकार के अंतर्गत स्वायत्त संघठन)
(Autonomous Organisation under the Dept. of Scientific and Industrial Research, Ministry of Science & Technology, Govt. of India)

डॉ. राकेश कुमार
निदेशक
Dr. Rakesh Kumar
Director

Date: 28.05.2018

Messages

I am very glad to know that the Environment and Social Development Association (ESDA), Delhi is organizing a two days National Conference on Environmental Challenges for "New India" in collaboration with Dr. B.R. Ambedkar College, University of Delhi, CSIR-National Environmental Engineering Research Institute (NEERI), Delhi Zonal Centre, and National Environmental Science Academy (NESA), Delhi during June 2-3, 2018 at Dr. Bhim Rao Ambedkar College, Delhi.

Environmental issues have become very crucial even for our day to day life/ activities, be it air pollution, water pollution, solid waste management, ecological biodiversity, socio-economic aspects and so on... The situation is going to be bad to worse, if the appropriate corrective measures are not taken in advance. I hope all these issues will be discussed in detail in the conference and some meaningful outcome will be there in the form of recommendations to meet the environmental challenges for New India.

I wish the conference a big success.

Rakesh Kumar
(Rakesh Kumar)

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सी. एस.आई. आर.- राष्ट्रीय पर्यावरण अभियांत्रिकी अनुसंधान संस्थान
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नीरी NEERI

CSIR-National Environmental Engineering Research Institute, Delhi Zonal Centre
A-93/94, Phase-I, Naraina Industrial Area, **New Delhi – 110 028, India**

From:
Dr. S.K. Goyal
Sr. Principal Scientist & Head

June 2, 2018

Messages

With continuous increase in population, worldwide and in India as well, the pace of development required to meet the needs and aspirations of people has put enormous pressure on the natural resources and in turn on the mother Earth. However, all the resources shall remain limited in the universe and can not be enhanced. The only possible way is to continuously evolve new technologies/processes that use lesser resources and generate more products to meet the requirement, while minimizing/eliminating the wastes generation. Even the minimal wastes generated are put back to the environment should be within the assimilative capacity of the environment. To ease the pressure on environment, it is the responsibility of all of us to extend our cooperation to save Mother Nature for the survival of present generation, as well as the generations to come.

It is indeed pleasure for me that the Environment and Social Development Association (ESDA), Delhi is organizing a two days National Conference on the Special Occasion of World Environment Day with the visionary theme of Environmental Challenges for "New India" in collaboration with Dr. Bhim Rao Ambedkar College, University of Delhi, CSIR-National Environmental Engineering Research Institute (NEERI), Delhi and National Environmental Science Academy (NESA), Delhi during June 2-3, 2018. As the country is looking for transformation to a *New India by 2022*, the environmental challenges would also assume larger dimensions, which need to be addressed/ tackled with much preparedness and ease. I am sure with the participation and deliberations by various stakeholders including experts, academicians, researchers, students and policy makers in the conference will help positively in shaping up the environmental challenges of "*envisioned New India*".

I congratulate the organizers and wish the Conference a Grand Success.

(S.K. Goyal)

Phone: +91 11-45609107; Telefax: +91 11-45609106 Email:sk_goyal@neeri.res.in;goyalneeri@gmail.com

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Ref. DBRAC/

Dated 30/05/2018

DEEPANSHU SHRIVASTAV
Chairperson, College Governing Body

Messages

At the outset, I would like to congratulate ESDA for organizing this two-day National Conference on Environmental Challenges for 'New India' in collaboration with our College along with CSIR-NEERI and NESA. It is a matter of pride for us to host this event in our college on the special occasion of the World Environment Day – 2018, with the theme "Beat Plastic Pollution". I congratulate the Principal, Dr. G. K. Arora and the Organizing Committee for taking up such a pertinent topic for the National Conference.

The proposed National Conference on the Environmental Challenges for 'New India' owes its relevance to the need of sustainable development in the face of the climate change and degraded air quality in many parts of India. There has been a renewed interest on protection of environment in changing times not only in academia but also among policy makers in the wake of climate change and abrupt climatic conditions. It is already too late to wake up and deal with pernicious outcome of development in the form of environmental degradation. Gradually, the issue of environment is taking a center stage and all decisions of development need to be based on the tenuous balance of environment and development. I wish the deliberations of this Conference come out with a clear strategy towards policy implications and decision-making.

Dr. Bhim Rao Ambedkar College is trying its best to address the environmental challenges not only at academic, but also at community level through its innovative initiatives. I extend my heartfelt wishes for successful organization of the Conference by the College.

I also wish all the best to the Organizing Committee and the participants of this National Conference.

(Deepanshu Shrivastav)

भीम राव अम्बेडकर महाविद्यालय
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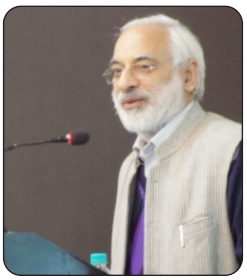
Ref. No. BRAC

Date: 29.05.2018

Dr. G.K. Arora
Principal



Messages

World Environment Day (WED) is the outcome of the UN sponsored first major 'Conference on Human Environment' popularly known as the Stockholm conference held from June 5-16, 1972. It is celebrated on 5th June every year since 1974. It has turned out to be one of the most important instrument of driving change for the 'Love of Nature' and saving 'Mother Nature' through public outreach, raising awareness levels, generating political momentum, and spearheading environment protection action plan.

Since 1987, every Environment Day has a different host country and a different environment friendly key topic. This time, India is a global host, and the theme is "Beating Plastic Pollution", highlighting that plastic use has become one of the serious environmental challenges. This theme is especially important for India given the fact that the country generates around 5.6 million tonnes per annum (TPA). That amounts to 15342 tonnes per day of plastic waste of which, above one-third remains un-collected and littered, out of the estimated production of 12 million tonnes.

It is now well acknowledged that plastic waste production, its consumption, disposal and management through unskilled recycling, and processing given the indiscriminate littering of plastics and its non-biodegradability features have serious environmental issues. These relate to toxic fugitive emissions, land infertility, chocking and clogging of sewerage/drainage systems and the use of scarce natural resources, which affect the liveable human and non-human lives. The Government of India (GoI) has taken many measures to regulate the plastic production, its usage and recycling. Still India has to do everything possible in a timely manner to curb plastic before the situation goes out of hand and the health of our future generations is endangered. On this occasion of WED, India is organizing many activities at the national level to make the people aware about the ills of plastic use and pollution created by it along with the measures required to curb it.

I am happy to record that our College has taken a lead by acceding a request from Environment and Social Development Association (ESDA) to collaborate along with CSIR- National Environmental Engineering Research Institute (NEERI) and National Environmental Science Academy (NESA), to organize a two-day National Conference on **Environmental Challenges for 'New India'** on 2nd-3rd June 2018. I am sure, this Conference would serve as an active platform for generating ideas, spreading mass awareness among different stakeholders particularly the young students.

I take this opportunity to thank all the distinguished guests, expert speakers, research scholars and students for their participation in our National Conference on the eve of celebration of World Environment Day 2018. I also thank our collaborators who chose us as their partner to hold such a conference. We appreciate their cooperation in all respects. Our College teams led by Dr. S.S. Chawla, Dr. Monica Ahlawat, Dr. Arvind Kumar Yadav, Dr. Jitendra Kumar Nagar, Dr. P.K. Singh, Dr. R.P. Dwivedi, Dr. Sarla Bhardwaj, Dr. D.K. Pandeya, Dr. R.N. Dubey, Dr. Kumar Manish and Ms. Sonam Dutta deserve sincere thanks for constantly and untiringly working for such a long period for the smooth conduct of this conference. I also request all the staff and students to support such a noble cause.

With Best Wishes,

Dr. G.K. Arora, Principal
30 May, 2018

ENVIRONMENT AND SOCIAL DEVELOPMENT ASSOCIATION (ESDA)

Date: 30.05.2018

Dr. Rakesh K. Rana
President

Messages

It gives me a great pleasure to welcome you in the National Conference on Environmental Challenges for 'New India' organised by Environment and Social Development Association (ESDA) in collaboration with Dr. Bhim Rao Ambedkar College of Delhi University, CSIR-National Environmental Engineering Research Institute (NEERI) and National Environmental Science Academy (NESA). I hope that the Conference would do justice in its aim of finding innovative solutions to the various environmental challenges being faced by 'New India'.

As we are moving in the process of development, we face enormous environmental challenges. Today, the choice is not of either development or environmental protection rather real issue is to strike the balance between development and environmental protection. I hope this academic deliberation would dwell upon these issues and would come up with some concrete recommendation in this regard. The concept of 'New India' as enunciated by Hon'ble Prime Minister aims to create balance between development and environment in coming days. The upcoming New India is not only about creating wealth and state-of-the art infrastructure but it is also about protection of environment and tackling the challenges.

I would like to wish all the organizing committee members, Chairman and Principal of Dr. Bhim Rao Ambedkar College, Director and Delhi Zonal Centre Head of CSIR-NEERI, and President of NESA for organizing this conference. I sincerely appreciate to Conference Organizing Secretary Dr. Jitendra Kumar Nagar who deserve sincere thanks for constantly and untiringly working for such a long period for the successfully conduct of this conference. I would also like to congratulate the ESDA members who work hard for the conference.

I wish the Conference a great success.

(Rakesh K. Rana)

ENVIRONMENT AND SOCIAL DEVELOPMENT ASSOCIATION (ESDA)

Mr. Umesh Chandra

Vice President

Date: 30.05.2018

Messages

I am pleased to know that Environment and Social Development Association (ESDA) is organizing a National Conference on Environmental Challenges for 'New India' in collaboration with Dr. Bhim Rao Ambedkar College (University of Delhi), CSIR-National Environmental Engineering Research Institute (NEERI) and National Environmental Science Academy (NESA) on the special occasion of World Environment Day – 2018 on 2nd – 3rd June, 2018.

As we are all aware that pollution, climate change, deforestation and urbanization are some of the most important global challenges in today's world. Solutions are needed to tackle these pressing problems in order to ensure sustainable development and conserving resources for the future generations. India cannot afford to lag behind other countries in addressing these pressing issues. I am sure that this National Conference would provide a good platform for meaningful deliberations between all the stakeholders so that some viable solutions could be sought out for the policy makers at international, national and regional levels.

I would like to congratulate all the organizing committee members, Chairman, Governing Body and Principal of Dr. Bhim Rao Ambedkar College, Director, CSIR-NEERI, President, ESDA and President, NESA for organizing this conference. I sincerely appreciate to Dr. Jitendra Kumar Nagar, Organizing Secretary of the Conference for his cooperation and hard work to organise the conference successfully.

I wish the Conference a great success.

(Umesh Chandra)

Head Office: H.No.-134, K K Chowk, Shastri Gali No.-10, Karawal Nagar, Delhi-94

National Environmental Science Academy

(Registered Under Society Act XXI of 1860)

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Date: 27.05.2018

Messages

I feel extremely delighted as the Environmental and Social Development Association (ESDA), Delhi in collaboration with Dr. Bhim Rao Ambedkar College (BRAC), University of Delhi, CSIR-National Environmental Engineering Research Institute (NEERI), Delhi and National Environmental Science Academy (NESA), Delhi organising a NATIONAL CONFERENCE ON ENVIRONMENTAL CHALLENGES FOR 'NEW INDIA" on 2nd and 3rd June, 2018 at College Auditorium, Dr. Bhim Rao Ambedkar College, University of Delhi, Main Wazirabad Road, Yamuna Vihar, Delhi-110094

The theme of the conference is quite relevant in view of the present day problems and the impact of environmental changes in Indian ecosystems.

On behalf of NESA I congratulate the Organising Committee of the conference for selecting a befitting topic "Environmental Changes for New India".

I am sure the students of the college and number of professionals and participants will be benefitted through the lectures on sub themes of the conference i.e. Air Pollution, Water Pollution, Global Warming, Sustainable Development, Solid Waste Management, Biodiversity Conservation, Environmental Problems, Natural Resource Management, Climate Change and Human Health etc.

The conference aims to foster interactive discussions among the scientists, academicians, corporates, policy makers, civil society and environmentalist.

I am sure, it will also attempt to present some viable solutions towards the environmental challenges being faced by the residents of NCR. The big challenge before us is the high concentration of Ozone (O3) in the air of the capital at various places in the city in the current months (May-June).

Second challenge is the availability of safe water for the population. This natural resource is declining and the population is increasing year by year. The new water conservation techniques will be discussed by the speakers during the conference.

A large proportion of India's population living in various basins and dependent on its natural resources and environment feels that their environs are undermined or compromised. The growth process and development models offer little hope for inclusive and peaceful 'sustainable human development' in India, which is the need of the hour.

I am, therefore, confident that the two day conference would witness rich academic discourse and discussion which in turn would throw up solutions to the issues in consideration before the conference.

I wish the conference a grand success.

(Javed Ahmad)

Dr.Monica Ahlawat
Teacher-In-Charge
Department of Environmental Studies
Dr.Bhim Rao Ambedkar College,
University of Delhi,Delhi
E-mail: monicaah29@gmail.com

Date: 30.05.2018

Messages

It gives me immense pleasure to welcome you all on the special occasion of World Environment Day National Conference on "Environmental Challenges of New India" on behalf of the Environmental Studies Department, Dr.Bhim Rao Ambedkar College, University of Delhi on 2nd-3rd June 2018.

The two- day seminar is being specially organised in the World Environment day week, which is on 5th June and this year India is the host country. This conference will have lectures and presentations by eminent Environmentalists, Geographers and multi-discipline intellectuals from various parts of the Nation. This interaction would help us in understanding the environmental challenges that our Nation is facing currently and also future threats.

I wish all the participants and delegates a fruitful and pleasant experience in the seminar.

Dr.Monica Ahlawat
Teacher-In-Charge
EVS

Dr. S. S. Chawla
Convener, National Conference
Dr. Bhim Rao Ambedkar College
University of Delhi, Delhi
Email: sschawla59@yahoo.com

Dated: 30.05.2018

Messages

On behalf of Dr. Bhim Rao Ambedkar College, I welcome you all in the National Conference on Environmental Challenges for 'New India'. The college feels privileged to host this National Conference in association with esteemed institutions like Environmental and Social Development Association (ESDA), CSIR - National Environmental Engineering Research Institute (NEERI) and National Environmental Science Academy (NESA).

The topic of the Conference is of great relevance in today's world as we are all struggling to find sustainable and viable solutions to various environmental problems the world over. Pollution of all kinds - air, water and noise – has become a serious concern and has resulted in the extinction of innumerable species in the world; and if the human existence is to continue, pollution in all its forms has to be checked in a time bound manner and a balance between 'development' and environment has to be created. India, in particular, is in dire need of the 'green solutions' to the problem of environmental degradation due to the overuse of natural resources in an irrational manner necessitated on the name of economic development and managing the rapidly growing huge population base.

The present National Conference is an attempt to deliberate upon various issues related to pollution and its chain effects. I am sure that the two days of academic deliberations and consultations during the Conference would provide an enriching platform to find these elusive 'green solutions'.

I would like to thank the President, ESDA; Director, NEERI; President, NESA and the officers and staff of these institutions; as well as the Principal Dr. G. K. Arora and the Chairman, Governing Body, Dr. Bhim Rao Ambdekar College for providing all the technical, academic, financial and logistic support for organizing this Conference. I also thank all my organizing committee members, faculty and non-teaching staff of the College for providing unconditional support in organizing this Conference. The Organizing Secretary, Dr. Jitendra Nagar, deserves special mention for his tireless work and nicely coordinating amongst all organizations involved in this Conference.

Best wishes to all the participants.

(Dr. S. S. Chawla)

Dr. Jitendra Kumar Nagar
Organizing Secretary, National Conference
Dr. Bhim Rao Ambedkar College
University of Delhi, Delhi
Email: jitendranagar79@gmail.com

Dated: 30.05.2018

Messages

Dear Colleagues, Conference Participants and all respected Guests,

It gives me a great pleasure to welcome you to National Conference on Environmental Challenges for 'New India' on the occasion of World Environment Day – 2018 on behalf of the organizers, Environment and Social Development Association (ESDA), Dr. BhimRaoAmbedkar College, CSIR-National Environmental Engineering Research Institute (NEERI) and National Environmental Science Academy (NESA). I hope that the Conference would do justice in its aim of finding innovative solutions to the various environmental challenges being faced by 'New India'.

I acknowledge with gratitude, the relentless support received from President ESDA, Director CSIR-NEERI, Head of CSIR-NEERI Delhi Zonal Centre Dr. S. K. Goyal, Governing Body Chairman Shri Deepanshu Shrivastav and Principal Dr. G.K. Arora of Dr. Bhim Rao Ambedkar College, President NESA and Conference Convener Dr. S. S. Chawla in organizing this National Conference smooth and successfully. I am grateful to all the eminent speakers and distinguished dignitaries who in spite of their busy schedules readily agreed to be a part of this Conference. I am also thankful to the all members of organizing committee, ESDA faculty Mr. Umesh Chandra, Dr. Geetanjali Kaushik, Mr. Kamal Singh & other Members of ESDA, fellow faculty members, colleagues and students who have worked tirelessly in making this Conference a grand success.

I hope that the Conference would serve as a nice platform in fostering active discussion between all the participants. Once gain, I thank all the participants and institutions for making this Conference a grand success.

(Dr Jitendra K Nagar)
Organizing Secretary

ORGANIZING COMMITTEE OF THE CONFERENCE

PATRONS

Mr. Deepanshu Shrivastava
Chairperson (Governing Body), Dr. Bhim Rao Ambedkar College, University of Delhi
Dr. S. K. Goyal
Sr. Principal Scientist & Head, CSIR-NEERI, Delhi Zonal Centre (DZC), Delhi

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- Mr. Kamal Singh, Vallabhbhai Patel Chest Institute, University of Delhi
- Mr. Gian Kashyap, National Environmental Science Academy, New Delhi
- Mr. Rakesh Kumar Roy, National Environmental Science Academy, New Delhi

ABOUT THE ORGANIZERS

Environmental and Social Development Association (ESDA), Delhi

Environment and Social Development Association (ESDA) is a non-government organization, registered on 23rd July, 2004 under Societies Registration Act-XXI of 1860 in Delhi. ESDA is a national based voluntary organization working for protection of environment and social development in 12 States of India with support of more than thousand volunteers. Its main aims and objectives include educating and creating awareness about environmental and social issues among young minds, students, researchers and general public; setting up regional and state chapters or executive committees to organize different academic, scientific and mass awareness activities such as National/International level conferences, symposia, seminars, workshops, meetings, Street Plays etc. on the themes of environmental concerns. ESDA is an open platform of people of the world who want to work as an Academician, Scientist, Activist, Volunteer, Member, Advisor and Sympathizer on environmental and social issues. Anyone from any part of the world may be a member of the Society (ESDA). Details of the activities and membership procedure of the society are given on www.esdaindia.org.

Dr. Bhim Rao Ambedkar College (BRAC), University of Delhi

Dr. Bhim Rao Ambedkar College, a co-educational College of University of Delhi, was established in 1991 by GNCTD to cater to the needs of Higher Education in the Trans-Yamuna area of Delhi. The College with the total student strength of about 3100 (girl students in good number) runs a number of professional and honours courses in addition to B.Com and B.A. (Program). It also functions as one of the study centres for the School of Open Learning (SOL), Non-Collegiate Women's Education Board (NCWEB), University of Delhi and Rajiv Gandhi National Institute of Youth Development. Besides, the college has been designated as one of the WUS Centres to meet the healthcare needs of University and College Staff and students.

You will be happy to know that the College has been performing quite well during the last few years in academics, Sports and ECAs. Our students are also known for their contribution to the College development. Well-known for its infrastructure, Herbal and Rose Gardens, Open Gym and Student-friendly schemes, the College was also awarded the "Commendation Prize for Good Practices" in 2015, and accredited B+ by NAAC.

CSIR-National Environmental Engineering Research Institute (NEERI), Delhi

National Environmental Engineering Research Institute (NEERI) is a constituent laboratory under Council of Scientific and Industrial Research (CSIR), New Delhi and has a nationwide presence with its five Zonal Centres located at Delhi, Mumbai, Chennai, Kolkata and Hyderabad with its Headquarters at Nagpur. CSIR–NEERI is devoted to research and innovations in Environmental Science and Engineering besides solving a range of environmental problems faced by the Industries and Public.CSIR-NEERI, Delhi Zonal Centre (DZC) established in 1959, is a supporting arm of CSIR-NEERI, with its Headquarters at Nagpur, for its activities in the Northern Region. Presently DZC has well-equipped laboratory with various sophisticated instruments and expertise in various environmental fields. DZC is handling a number of Consultancy and R&D projects.

National Environmental Science Academy (NESA), Delhi

This National level Academy, registered by the provisions of Societies Act XXI of 1860 under the Government of Bihar in 1988, was formed with an objective to bring awareness about the environment among the masses, and presently functions with its Headquarters at New Delhi. Its major aims and objectives include promotion of environmental sciences among young minds and researchers, setting up regional and state Chapters for dissemination of information on environment, to hold annual conference, to organize national/international level conferences, symposia, seminars, meetings and workshops on themes of environmental concerns and to publish policy papers, synthesis volumes, proceedings, journals, newsletter, transactions and

NATIONAL CONFERENCE
on
ENVIRONMENTAL CHALLENGES FOR 'NEW INDIA'

Organized by: **Environment and Social Development Association (ESDA), Delhi**
In Collaboration With: **Dr. Bhim Rao Ambedkar College, University of Delhi, Delhi**
CSIR-National Environmental Engineering Research Institute &
National Environmental Science Academy, Delhi

Date: 2nd - 3rd June, 2018 Time: 9.00 AM – 5.30 PM

Venue: Auditorium, Dr. Bhim Rao Ambedkar College, University of Delhi,
Main Wazirabad Road, Yamuna Vihar, Delhi-94

Conference Schedule

DAY – I: 2nd June, 2018 (Saturday)

Registration: 08:30 AM – 09:30 AM

Breakfast 08:30 AM – 09:30 AM

INAUGURAL SESSION (9:30 AM – 12:30 PM) (Auditorium)

Session Coordinator:	**Dr. Monica Ahlawat, BRAC**
09:30 AM – 09:40 AM	Welcome of Guests by Pot of Plants and Ang Vastra (Shal)
09:40 AM – 09:50 AM	Lighting of Lamp and Ma Saraswati Vandana
09:50 AM – 10:00 AM	Introducing the Conference: **Dr. Jitendra K Nagar, Organizing Secretary, National Conference**
10:00 AM – 10:15 AM	Welcome Address: **Dr. G.K. Arora,** Chairman of the National Conference Principal, Dr BhimRaoAmbedkar College, University of Delhi
10:15 AM –10:25 AM	Address by (ESDA Faculty) **Dr. Geetanjali Kaushik** Executive Director, Environment & Social Development Association
10:25 AM – 10:35 AM	Address by Co-Patron: (NESA Faculty) **Prof. Javed Ahmad,** President, National Environmental Science Academy, Delhi
10:35 AM – 11:20 AM	Address by Chief Guest: **Water Man Dr. Rajendra Singh,** President, Tarun Bharat Sangh & Jal Biradari
11:20 AM – 11:50 AM	Key note Speaker: **Prof. R. B. Singh,** Delhi School of Economics, Delhi University Secretary General, International Geographical Union
11:50 PM – 12:05 PM	Address by Patron: (NEERI Faculty) **Dr. S.K. Goyal** , Sr. Principal Scientist & Head, CSIR-NEERI, Delhi Zonal Centre (DZC)
12:05 PM – 12:20 PM	Presidential Address by Patron: **Mr. Deepanshu Shrivastava** Chairman, Governing Body, Dr. Bhim Rao Ambedkar College, DU
12:20 PM – 12:30 PM	Mementos present to Distinguished Guests
12:30 PM – 12:40 PM	Vote of Thanks by: **Dr. S. S. Chawla,** Convener of the Conference
12:40 PM – 01:00 PM	**Plantation by Distinguished Guests**

Lunch: 01:00 PM – 02:00 PM

TECHNICAL SESSION (II)- Plenary Session (Auditorium) **(02:00 PM – 03:40 PM)**

Themes: Air Pollution & Smog in Delhi-NCR and other Metro Cities; Global Warming and Climate Change

Time Slot	Panelists/ Expert Speakers
02:00 PM – 02:20 PM	**Prof. Raj Kumar** Director, Vallabhbhai Patel Chest Institute,University of Delhi.
02:20 PM – 02:40 PM	**Prof. B.R. Gurjar** Department of Civil & Environment Engineering, IIT Roorkee
02:40 PM – 03:00 PM	**Dr. Anil K. Srivastava** Former Chief Scientist & Additional Director, NMRL, DRDO, Mumbai
03:00 PM – 03:20 PM	**Dr. S.K. Goyal** Sr. Principal Scientist & Head, CSIR-NEERI, Delhi Zonal Centre (DZC)
03:20 PM – 03:40 PM	**Dr. Brij Kishore Gupta** Evaluation and Monitoring Officer, Central Zoo Authority, Ministry of Environment. Forest and Climate Change, Delhi

High Tea: (03:40 PM – 04:10 PM)

TECHNICAL SESSION (II) **- Plenary Session (Auditorium) (04:10 PM – 5:50 PM)**

Themes: Municipal Solid Waste: Rules, Management Problems and Solutions

Session Coordinator:	
Time Slot	**Panelists/ Expert Speakers**
04:10PM – 04:30AM	**Dr. Sanchita Jindal** Former Advisor, Ministry of Environment, Forest and Climate Change, Delhi
04:30 PM – 04:50 PM	**Mr. Pradeep Khandelwal** Chief Engineer, East Delhi Municipal Corporation, Delhi
04:50 PM – 05:10 PM	**Dr. Ashutosh Gautam** General Manager, India Glycols Limited, Kashipur, Uttarakhand
05:10 PM – 05:30 PM	**Mr. Sandeep Malhotra** Senior Manager, IL&FS Environmental Infrastructure & Services Limited, New Delhi
05:30 PM – 05:50 PM	**Mr. Sandeep Patel** CEO – Founder, Let's Recycle - A NEPRA Resource Management Pvt. Ltd, Ahmedabad, Gujarat

DAY – II: 3rd June, 2018 (Sunday)

Breakfast: 08:30 AM – 09:00 AM

PARALLEL TECHNICAL SESSION (III):

Plenary Session (Auditorium) (9:20AM – 11:00AM)

Themes: Water Pollution, Crises, Conflict and Solutions

Session Coordinator: (Students):	
Time Slot	**Panelists/ Expert Speakers**
09:20AM – 09:40AM	**Er. Paritosh Tyagi** Former Chairman, Central Pollution Control Board (CPCB), Delhi
09:40 AM – 10:00 AM	**Dr. Kshipra Misra** Former Additional Director, DBCS, Defense Institute of Physiology and Allied Sciences, DRDO, Timarpur, Delhi
10:00 AM – 10:20 AM	**Prof. Sirajuddin Ahmed** Civil Engineering Department, Jamia Milia Ismalia
10:20 AM – 10:40 AM	**Er. V.P. Yadav** Additional Director, Central Pollution Control Board (CPCB), Delhi
10:40 AM – 11:00 AM	**Mr. Ashok Kumar** Managing-Technical, URS Verification Pvt. Limited, Noida

PARALLEL TECHNICAL SESSION (IV):

Open Award Session Oral - (Computer Lab) **(9:00 AM – 11:00 AM)**

Chair: Dm. Veer Mahendra Prakash Singh, Delhi President, ESDA
Co-chair: Mr. Jagat Singh, Delhi Vice President, ESDA
Co-chair: Mr. Susheel Nagar, Corporate EHS Head, Sunbeam Auto Pvt. Ltd. Gurgaon
Invited Speaker: Dr. Yugal Jha Head, Political Science, K.K.M. College, Pakur, S.K.M. University, Jharkhand

Paper Presentation (Oral): 20 participants selected for paper presentation (Oral)

High Tea: 11:00 AM – 11:30 AM

PARALLEL TECHNICAL SESSION (V):

Plenary Session (Auditorium) **(11:30 AM – 01:00 PM)**

Special Session: Corporates, Environmental Activists, Environmental Law Experts, Environmental Journalism, Etc.

Session Coordinator: (Students):	
Time Slot	**Panelists/ Expert Speakers**
11:30 AM – 11:45 AM	**Ms. Sapna Bakshi**, Sr. Associate, Maven- Client Servicing at Windchimes Communication, Gurgaon, Haryana
11:45 AM – 12:00 PM	**Dr. Suresh Deshwal** Head, Geography Dept., Govt. PG College, Ambala, Haryana

12:00 PM – 12:15 PM	**Mr. Sanjay Kumar Swami** Environmental Activist&Co-Coordinator, SSUN, Delhi
12:15 PM – 12:30 PM	**Mr. Ramesh Goel Advocate** Water Activist, Jaipur, Rajasthan
12:30 PM – 12:45 PM	**Mr. Mohan Kumar,** Environment Activist, Agra, UP

PARALLEL TECHNICAL SESSION (VI):

Open Award Session (Oral) (Computer Lab) **(11:30 AM – 01:00 PM)**

Chair: Dr. Jitendra K Nagar, Assistant Professor, Dr. Bhim Rao Ambedkar College, DU
Co-chair: Mr. Rajendra Prasad Gangwar, Manager, EHS, UNO Minda, Gurgaon
Co-chair: Mr. Ashok Agarwal, Delight Industrial Solutions Pvt. Ltd., Alwar, Rajasthan
***Invited Speaker*:** Dr. Alok Sharma, Faculty of Law, University of Delhi, Delhi

Paper Presentation (Oral): 15 participants selected for paper presentation (Oral)

TECHNICAL SESSION (VII)

Poster Award Session: (Venue: College Gallery) **(12.30 PM – 01.30 PM)**

Lunch: 01:00 PM – 02:00 PM

PARALLEL TECHNICAL SESSION (VIII):

PANEL DISCUSSION (Auditorium) **(02.00 PM – 03:30PM)**

Theme: Way forward to Meet Environmental Challenges for New India Sustainably

PANELISTS:
1. **Er. Paritosh Tyagi, Former** Chairman, Central Pollution Control Board (CPCB), Delhi (Moderator)
2. **Dr. G. K. Arora,** Principal, Dr. Bhim Rao Ambedkar College, DU
3. **Dr. Anil K. Srivastava,** Former Chief Scientist & Additional Director, NMRL, DRDO, Mumbai
4. **Er. J. K. Bassin,** Former Head, CSIR-NEERI, Delhi
5. **Dr. B. W. Pandey,** Department of Geography, Delhi School of Economics, Delhi University
6. **Mr. Abhishek K Chaudhary** Advocate, High Court of Delhi, Delhi

PARALLEL TECHNICAL SESSION (IX):

Open Award Session (Oral) (Computer Lab) **(02:00 PM – 03:30 PM)**

Chair: Dr. Vinod Kumar Shanwal, Head, Department of Education & Training, Gautam Buddha University, Greater Noida
Co-chair: Mr. Sunil Satyam, Assistant Commissioner, State GST Department, Saharanpur
Co-chair: Dr. Arvind K Yadav, Assistant Professor, Dr Bhim Rao Ambedkar College, DU
Invited Speaker: Dr. Kishor Kumar, Associate Professor, Govt. Girls P. G. College, Badalpur, Gautambuddh Nagar (U.P.)

Paper Presentation (Oral): 15 participants selected for paper presentation (Oral)

Tea: 03:30 PM – 03:45 AM

Valedictory Session - 03:45 PM – 06:00 PM

Session Coordinator: Dr. Bishnu Mohan Das, BRAC

03:45 PM – 03:55 PM	**Presentation of Report:** Dr. S. S. Chawla, Convener, BRAC
03:55 PM - 04:15 PM	**Address by Chairman of the Conference** Dr. G.K. Arora, Principal, Dr Bhim Rao Ambedkar College, DU
04:15 PM – 04:25 PM	**Address by (ESDA Faculty)** Dr. Geetanjali Kaushik Executive Director, Environment. & Social Development Assoc.
04:25 PM – 04:45 PM	**Address by Guest of Honor:** Prof. Surendra Singh Delhi School of Economics, University of Delhi
04:45 PM – 05:15 PM	**Address by Chief Guest:** Shri Balvinder Kumar, IAS Chairman, Green The Earth, Delhi
05:15 PM – 05:45 PM	**Presidential Address by Patron:** Mr. Deepanshu Shrivastava Chairman, Governing Body, Dr. Bhim Rao Ambedkar College, DU
05:45 PM – 06:00 PM	**Vote of Thanks:** Dr. Jitendra K Nagar, Organizing Secretary of the National Conference,
06:00 PM – 06:02 PM	***National Anthem***

High Tea - 6:05 PM – 06:30 PM

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2-3 June, 2018

at Dr. Bhim Rao Ambedkar College, University of Delhi, Delhi

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CONTENTS

ABSTRACTS

CONVERSION OF HUMAN EXCRETA INTO RENEWABLE ENERGY: SCOPE AND OPTIONS FOR "NEW INDIA"

Anil K. Shrivastava

Naval Materials Research Laboratory, DRDO
Ministry of Defence, Govt. of India, Mumbai

ABSTRACT

The development of sustainable energy systems is one of the top priorities for global development and the driving force for major political and societal reforms for New India.The generation of energy from human excreta is still in nascent stage in India. The possibility of generating energy from human excreta provides the country the unique opportunity to address the emerging energy challenges and convert them into prospects. In the present communication an attempt will be made to explore the possibility of conversion of human excreta into renewable energy. Also, to harness that potential for New India, need for ensuring policy convergence among the existing government schemes, namely, Nirmal Bharat Abhiyan (NBM), National Rural Health Mission (NRHM), National Urban Health Mission(NUHM), Provision for Urban Amenities in Rural Areas (PURA), the relevant Missions under the Ministry of New & Renewable Energy will be brought out. Utilization of human waste is considered beneficial in terms of the process because it does not require additional starter (micro organisms seeds) and a supply of micro organisms occurs continuously during the feeding of raw materials. Product gas resulting from typical dry human feces have LHV and energy values of 17.2 MJ/kg and 24 MJ/kg, respectively, at optimum equivalence ratio of 0.31 values that are comparable to wood biomass.In the present paper merits, demerits, advantages, limitations of various engineered technologies employed for turning human excreta into energy will be critically reviewed on the basis of their innovations, user friendliness, cost effectiveness, maintenance etc.Also, health aspects of biogas generated, design and R &D aspects of biogas plant fed by human excreta with or without supplementary feed stocks, treatment of slurry and its use, strategy for promotion and integration with other programs will be thoroughly discussed.

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ROLE OF PLANTS IN CURBING THE THREAT OF ENVIRONMENTAL POLLUTION: INDIAN CONTEXT

Suresh Deswal

Geography Department
Government PG College, Ambala Cantt, Haryana

ABSTRACT

India has progressed significantly in several fields like Science & Technology and has even completed the mission to Red Planet Mars successfully to mark its presence as one of the most emerging powerful country in space technology. But, if we visualize second face of the coin; India, once known as heaven on Earth for its pristine ecological system and rich value based life, is now known more as the land of pollution (air, water, soil). It is very shocking, India is among the bottom five countries on the Environmental Performance Index (EPI) 2018, ranking 177 out of 180 countries. As per 2018 WHO global air pollution out of 15 most polluted cities in the world 14 cities belong to India. Approximately 25 lakh people die in India every year due to air pollution; it is highest in the world followed by China. Recently ACS journal "Environmental Science and Technology" published a report stating that Trees , bushes and other greenery growing in concrete and glass canyons of cities can reduce levels of two of the most worrisome air pollutants by 8 times more than previously believed. Forest land is regularly being encroached upon and turned into industrial and residential land. For ex: - Punjab during past 30 years has diverted 44.56% of forest land towards industrial purpose. Similarly Haryana has converted 9.9% of forest land into industrial hubs. Undoubtedly, every year plantation drives are organized throughout the country but the new trees planted that the government claims is just a hoax and crores of rupees are wasted as there is no proper social as well as official auditing system in place in India to check how many of those trees survived and grew up to maturity. Example Uttar Pradesh government planted 5 crore trees in 24 hours in 2016 and created a world record But there is no status reports on what happened after these were planted, how many of them survived? Even the policies that are being made are just on paper and actual work done on ground is negligible. The main issue to consider is that it is not the lack of knowledge or technological requirement that hinders our efforts in curbing pollution but it is the lack of will and implementation on governments part and also on the individuals part to tackle and eradicate this menace .I believe that we the people have the most important role to play in this endeavor, we have to remember in our minds the great examples of sacrifice that our ancestors have set in protecting trees and environment, examples like Chipkoo movement and Khejadli (a village in Jodhpur, Rajasthan where in 1731AD 363 people gave up their lives fighting to protect the trees from being cut down by the king). I believe that environment pollution can be controlled by adhering to the thoughts of Saint Swami Vivekananda "**Running away from any problem will only increase the distance from the solution. So face it and finish it**".

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DEVELOPING A CLEAN AIR MANAGEMENT PLAN FOR AURANGABAD CITY

Jitendra Sangewar[1] and Geetanjali Kaushik[2]

[1]Regional Office, Maharashtra Pollution Control Board, Aurangabad Maharashtra
[2]Department of Civil Engineering MGM's JNEC, Aurangabad Maharashtra

ABSTRACT

Across the world, air pollution has emerged as one of the grave threats to public health. According to a report by The Energy Research Institute (TERI) and UC San Diego (University of California at San Diego) (2016), 80% of Indian cities are unable to meet the prescribed air quality standards and in almost 56% of these cities, the pollutant levels are nearly 1.5 times the permissible limits resulting in high mortality and morbidity. Managing India's air pollution requires a comprehensive national action plan with a focus on city level management plans. City level management requires stakeholder engagement, an informed city and trained personnel to deal with the complex issues of air quality monitoring as well as financial support.

Aurangabad city has been listed under the 17 nonattainment cities in Maharashtra based on the observation of exceedance with respect to National Ambient Air Quality Standards 2009 consecutively during 2011 to 2015. Particulate matter is a cause of concern for the city. Aurangabad's Air Quality Action Plan highlights action under various points.

Aurangabad currently has four monitoring stations for one million residents; it should have six monitoring stations within the city in commercial, industrial and sensitive areas. City lacks display boards providing air quality information to public. Further the emission inventory and source apportionment studies need to be completed at the earliest in order to highlight the sources of pollution and their respective contribution to city's air quality. City also needs to urgently undertake research studies on the impact of air pollution on health, extensive drive against polluting vehicles, public awareness campaigns for air pollution control, vehicle maintenance and minimizing use of personal vehicles, and prevent parking of vehicles in congested areas. Provision of public transport needs to be ensured. District administration must ensure unadulterated fuel and also provide clean fuel to city residents. AMC must implement various initiatives planned under the Smart City plan in a time bound manner for improving city's air quality.

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NEARLY ZERO ENERGY HOUSE WITH SMART AIR HANDLING UNIT: A CASE OF ENERGY EFFICIENT BUILDING AT BELGIUM

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ABSTRACT

This paper presents an investigation carried out using a multi-zone building model simulated with the help of TRNSYS 17. The building model integrates systems such as an air–air heat exchanger (AAHE), a water–air heat exchanger (WAHE) coupled with an earth–water heat exchanger (EWHE). The temperature based control strategies were recommended for these systems based on the simulation results. The AAHE and the EWHE have impact of 66% and 7% respectively on reduction of the annual heating consumption of the house. The annual heating consumption of the house per unit floor area was estimated as 6.9 kWh/(m2 year)which is within the passive house standard in the Europe. There is significant reduction of the overheating time above 25◦C due to the EWHE installed in the present house with annual ventilation air cooling contribution of 602.6 kWh/year. The case study reveals following key conclusions. House has all supply zones operative temperatures below 20◦C for 0–15% time of the year. Overheating room air above 25◦C found only 0–5% time of the year. The annual heating consumption of the present house is determined as **3865.2 kWh/year** which corresponds to the annual heating consumption of **6.9 kWh/(m2 year) per unit floor area** of the house within the passive house standard (⩽ 15 kWh/(m2year))

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AN OVERVIEW ON WATER QUALITY STATUS OF GANGA RIVER

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ABSTRACT

The Ganga is a holy & historical river of India and also a lifeline of a large population. Its basin covers more than 26% of the country's area and drains 25% of the annual run-off. Rapid urbanization, industrialization and steep demand for water have led to serious problems of water quality degradation. About 12,222 million liters per day (MLD) of domestic and 2500 MLD of industrial wastewater is generated in the entire basin, out of which about 2723 MLD of wastewater is generated along its bank from class I & II cities. There are 138 drains and 764 grossly polluting industries in mainstream of Ganga that discharging 6087 MLD and 501 MLD of wastewater, respectively. Mass bathing is also a one of the most reason of pollution of Ganga River. Water quality monitoring indicated that the river is polluted in some of the segments, the worst affected lying between Kannauj and Varanasi. The mean concentrations of BOD and coliforms (TC & FC) in Ganga were increased from up to downstream at Kannauj, Kanpur, Varanasi and Patna that showing the major contributors of pollution in Ganga River. BOD and coliforms were also high at mostly locations compared to the permissible limit. The polluted water of Ganga River is ecologically harmful to the Ganges River dolphin population and the water in the Ganges has been correlated to contracting dysentery, cholera, hepatitis, as well as severe diarrhea which continue to be one of the leading causes of death of children in India. The efforts made to restore water quality through the Ganga Action Plan were grossly inadequate. Now, NGRBA, NMCG and NamamiGange program are implement a management plan in the entire Ganga basin in order to achieve water quality in the Ganga and its tributaries. The CPCB is also playing a significant role to prevention and control of Ganga River pollution and improve its water quality & ecological flows.

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ASSESSMENT OF AMBIENT AIR QUALITY AT DIFFERENT LOCATIONS IN DELHI

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ABSTRACT

Deteriorating air quality in Delhi city is one of the major concerns for public as well as policy makers who are continuously trying to reduce the air pollution level below the specified standards. The present study analysed and compared the ambient air quality data collected for last five years (2013-2017) at three differently located manual monitoring stations in Delhi city under NAMP. Out of total 10 NAMP stations in Delhi, the Naraina, Town Hall, and Sarojini Nagar stations represent Industrial, Commercial and Residential sites, respectively and are operated by NEERI, Delhi as per the NAMP protocol. The Respirable Suspended Particulate Matter (RSPM), Nitrogen dioxide (NO2), Sulphur Dioxide (SO2) and Ammonia (NH3) concentrations data were compared for daily, seasonal and annual variations. It has been observed that most of time the 24 hourly average values of NO2andRSPMhave exceeded the National Ambient Air Quality Standards (NAAQS) of 80 g/m3 and 100 g/m3 except during monsoon season. However, the 24 hourly average SO2 andNH3 concentrations for all the three sites were well within the permissible limits of 80g/m3 and 400g/m3respectively. Further, the annual average values of RSPM ranged between 264-322g/m3 for industrial, 191-219 g/m3 for commercial and 150-186g/m3 for residential site during the study period. These values for NO2 varied between 88-99g/m3 at industrial, 94-117g/m3at commercial and 84-93g/m3 at residential sites, respectively. It indicates that annual average values also exceeded the NAAQS. Further, seasonal comparison of concentration levels, indicates low pollution during monsoon season (June-September) and found below the NAAQS; however pollutants concentration were high during winter months (November- February) exceeding the standards manifold. The paper presents critical analysis of air quality at sites representing there different activity zones for last five years period. The analysis suggests that control/management measures need to be undertaken first with respect to different sources present in the vicinity of the AQM sites.

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ASSESSMENT OF AIRBORNE FUNGAL PARTICLES IN MICRO-ENVIRONMENTS OF A RESEARCH LABORATORY PREMISES IN DELHI

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ABSTRACT

Fungi are ubiquitous in the indoor environments and are potential threat to human health. Life style changes of human have resulted in the increased concentration of fungal aerosols that pollute the environment of the built structures and cause health hazards including allergy, infections and toxicity. In order to assess the health hazards caused by these microbial aerosols, a study was carried out at a Research Laboratory in Delhi to monitor the air quality by quantifying and characterizing the fungal aerosols. Fungal aerosol samples were collected from 9 different locations i.e. 1st floor Reception, Ground floor Reception, Basement, Terrace, Cafeteria, Conference room, Office, Chemistry lab and Toilet during the period of February-April, 2017.The fungal aerosols concentrations ranged from 201-1139 cfu/m^3 in spring (February-March) and 44-172 cfu/m^3 in summer (April) season, at different locations of the building. The highest average concentrations were found at the Cafeteria area (793 cfu/m3) and Ground floor Reception area (791cfu/m^3) followed by basement (569 cfu/m^3) while minimum concentrations were observed at Office area (138 cfu/m^3) and First floor Reception area (243 cfu/m^3). In this study, total 26 fungal colonies were isolated on the basis of differences in morphological characteristics, and those belonged to total 8 fungal genera. Among all 8 identified genera, Alternaria (23.1%) and *Aspergillus* (23.0%) were found as most dominating genera followed by *Cladosporium* (20.9%), *Penicillium* (18.2%), *Paecilomyces* (8.7%), *Epicoccum* (4.4%) ,Fusarium(1.7%) and Trichothecium (0.1%). Presence of dampness, moisture and organic food material were found to be the factors responsible for the fungal aerosols load in indoor micro-environments. This study gives an indication of microbial growth in the environment of modern built structures and calls for the need of further studies in various other indoor environments right from individual houses to malls, office/industrial premises. Such studies will help policy makers to formulate air quality standards for bio-aerosols in indoor environments for India.

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EVALUATION OF SUITABILITY OF AIR QUALITY MONITORING SITES – A CASE STUDY OF DELHI

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ABSTRACT

Delhi megacity has become a complex urban sprawl confronted with numerous pollution generating activities that disrupts environmental assets and results in unprecedented high air pollution levels. Air pollution sources in the city are distributed unevenly and are heterogeneous in nature, which result into the formation of air pollution hotspots in the city. Many times these air pollution hotspots are captured by air quality monitoring (AQM) station and represent air quality level of the city. The present study discusses the AQM network comprising of 21 continuous ambient air Quality monitoring stations (CAAQMS) in Delhi, operated by DPCC (Delhi Pollution Control Committee) and CPCB (Central Pollution Control Board). These stations have been categorized on the basis of 5 land use types i.e. mixed land-use, kerbside, residential, commercial and industrial area category. The study analyses air quality levels at differently located CAAQMS for both, particulate matter (PM10) and gaseous pollutants (NO_x, CO) based on land-use pattern. Data monitored simultaneously at 21 CAAQMS during February 15-20, 2018 has been analyzed, which indicates that PM10 concentrations were highest at Industrial and kerbside locations, whereas NO_x and CO concentrations were found higher at the kerbside and mixed land use locations during the study period. Further, suitability of AQM stations is evaluated for one of the locations (Anand Vihar) using air quality dispersion modelling technique. It is observed that PM_{10}, CO and NO_x concentration levels may decrease by 12.9%, 1.2% and 44.4%, respectively if AQM station is shifted by 50 m away from the kerbside, where traffic movement due to buses is very high. The study also suggests evaluation of suitability of each monitoring station based on land-use type and prevailing activities. Representativeness of air quality monitoring station should also be considered/specified, while estimating air quality index (AQI) and further disseminating to the public.

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ASSESSMENT OF AIR POLLUTION IMPACT DUE TO MSW DUMPSITE – A CASE STUDY OF GHAZIPUR SITE IN DELHI

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ABSTRACT

Elevated level of air pollution in Delhi city is becoming one of the critical issues for policymakers and public, who are at risk of related health problems. Pollution levels exceed significantly the specified national ambient air quality standards (NAAQS) especially during winter season. Numerous sources (e.g. vehicular pollution, road dust, biomass burning, domestic emission, industries) along with poor meteorological conditions are responsible for the high levels of air pollution in the city. The present study is an attempt to assess the impact of one of the un-accounted sources of air pollution i.e., Municipal Solid Waste (MSW) landfill facility on the surrounding environment. Delhi city generates ~ 37 lakh tons per year (LTPA) of MSW from its five municipal bodies. The non-segregated, collected waste goes to four landfill facilities, where further processing occurs. One of the Municipal Corporations, the East Delhi (EDMC) uses Ghazipur landfill site/ dumpsite for its MSW treatment and disposal which is considered as case study in the present paper. The EDMC generates ~11 LTPA of MSW, out of which, ~ 09LTPA (80% collection efficiency) is collected and dumped every year at this landfill site. As per SWEET (Solid Waste Emission Estimation Tool) model estimation, the landfill site annually emits 665 tons NO_x, 462 tons SO_2 and 2089 tons PM2.5. Further, impact of these emissions is predicted using AERMOD air quality model, which indicates that the maximum contribution of NO_x is about 81μg/m3 at a distance of 400 m from the dumpsite, which reduces to 10 μg/m3 at 5 km distance. The study suggests indicate a zone of influence of air pollution around the dumpsite site. The study also provides a methodological protocol for defining the safe zone around a landfill/dumpsite site which can be used for creating any new landfill site.

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ASSESSMENT OF HEAVY METALS IN EXCRETA OF BLUE ROCK PIGEON FROM DIFFERENT INDUSTRIAL REGIONS OF JAIPUR

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ABSTRACT

Heavy metal pollution is a long faced threat and hazard to society in developing countries such as India where fundamental industries occupying different industrial zones are the potential source of metal pollution. Heavy metal pollution is defined as occurrence of trace metals at a level larger than that would exist naturally in the environment and is detrimental as this imbalances the ecosystem because of their high bioaccumulation ability in biota and induce lethal effect and even in some cases death in living organisms. The objective of present research was to monitor level of six toxic metals in excreta of blue rock pigeon from six main industrial regions of Jaipur i.e., Jhotwara, Malviya, Mansarover, Sanganer, Sitapura and Vishwakarma industrial areas by using atomic absorption spectrophotometer. At the same time, heavy metals were also analysed from a reference area so that a correlative impact of the trace metal pollution from the industries could be figured out. From the Results it was found that Cd, Cr, Cu, Ni, Pb and Zn lies in concentration range of (0.045-1.12 ppm), (3.38-18.6 ppm), (15.1-128.9 ppm), (2.98-17.0 ppm), (5.8-79.6 ppm) and (136-2250 ppm) respectively while their average abundance followed the order Zn>Cu> Pb>Cr>Ni>Cd. The mean concentrations of Pb, Cu and Zn were very much higher in Sitapura industrial area than other studied industrial areas. Further concentration of heavy metals was varied significantly at 5% level of significance between industrial areas and reference area as well as among different industrial areas. The observed high concentration of different heavy metals in fecal pellets of birds shows their exposure to heavy metal pollution which is warning to spiked environmental pollution.

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HEALTH BENEFITS DERIVED BY REDUCING AIR POLLUTION: AN ANALYSIS OF EAST DELHI

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ABSTRACT

The paper implicates the study of health impact due to air pollution in East Delhi. Air pollution causes deterioration in the health status of people due to which a major proportion of their income is incurred on medical expenditure. The major objective of this research is to approximately appraise the benefit that an individual would attain in East Delhi, if there is a reduction in air pollution in this region, or similarly reiterated, an increment in the air quality of the regions located in East Delhi. The research methodology engages a household production function model which is based on household survey of areas which are within half a kilometre distance from the main air pollution monitoring stations of CPCB (Central Pollution Control Board) and DPCC (Delhi Pollution Control Committee) located at Anand Vihar, Nizamuddin, Shahdara and Dilshad Garden. This model is used to determine the relationships among the willingness of the people to pay for a reduction in pollution, cost of treatment, both direct as well as indirect costs. The method of computing the monetary benefit of reducing air pollution involves the regressing number of sick days on environment quality, mitigating activity, stock of health capital and stock of social capital. The paper investigates that the indoor pollution, ambient air pollution and poor health stock increase the probability of falling sick. This reduced probability of falling sick implies a monetary benefit that individuals will acquire as a result of reduction in Air Pollution. Various factors, including nutrition, eating habits, usage of heat generating electronic devices, etc. are related with the number of sick days that a person has, and an increase in the aforementioned independent activities decreases the dependent variable (no. of sick days). The study holds a significant role in spreading awareness about air pollution among the people in Delhi and helps us to identify the reasons for high indoor pollution in various regions of Delhi. By safeguarding the health of the individuals, the society would contribute to the building up of human capital which is more productive and efficient, since health is a crucial constituent of human capital.

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MICROBIAL DEGRADATION OF ORGANIC AROMATIC COMPOUNDS

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ABSTRACT

DDT and lindane are the most exhaustively applied pesticides due to their broad-spectrum activity but infamous for the health hazards they can cause. Apart from DDT and lindane, many aromatic compounds also take entry in to the environment through industrial activities. This has been the area of concern for the scientific fraternity for long. Although the application of these pesticides and aromatics is not even a century old practice, the negative effects started to appear almost five decades ago. Microbial remediation of synthetic pesticides and aromatic pollutants can be a promising area to explore for green and clean environment. A microbial consortium was obtained by long term enrichment of water from the local contaminated water bodies that could simultaneously degrade the spiked equal concentrations of DDT and lindane in shake flasks. Concentrations of 5, 10, & 20 ppm of these pesticides, when inoculated with the enriched consortium, were reduced to 50.8%, 56.3%, 65.1% DDT and 41.9%, 49.6%, 69.8% lindane respectively for corresponding concentrations. The optimum conditions for simultaneous degradation of these pesticides were found to be pH 7 and 30oC. This consortium can be a great option towards creation of clean environment. When the consortium was inoculated to waters spiked with catechol, chlorophenol and p-nitrophenol, these compounds were reduced by more than half within 96 h of incubation under ambient conditions at 120 rpm.

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DYNAMIC LINKAGES BETWEEN ECONOMIC GROWTH, CO_2 EMISSIONS & ENVIRONMENTAL DEGRADATION: A CASE OF INDIA AND CHINA

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ABSTRACT

The present study is an attempt to model the relation between economic growth, energy consumption & environmental degradation for India and China. A lot of empirical studies have shown that economic growth was mainly driven by high energy consumption which also results in increased CO2 emissions. The aim of our study is to prove; whether or not the same argument is true for the two emerging economies India & China. The variables which were included in our study were CO_2 Emissions, Forest Area and GDP per Capita with two external regressors, trade as a % of GDP (trade openness) and domestic credit to the private sector. The econometric tests used in the study include the ARDL bounds Co-integration test, ADF unit root and KPSS test for Stationarity, BG-LM Serial Correlation test and CUSUM stability plot. The results of the study showed that long run 'F' Bounds Co-integration test of ARDL was accepted for India but was rejected in case of China. For India temporal causality was also seen to flow from Forest Area (proxy for environment) to Per Capita GDP with negative cause effect relation. This showed that with the decrease in forest cover there was a rise in economic growth which is in line with most of the empirical studies. The results also showed that the process of movement towards equilibrium was unexpectedly slow @ less than 0.1 % per period as given by error correcting term which was found to be negative and significant.

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SOUND STEPS FOR MANAGEMENT OF SOLID WASTE IN JALANDHAR

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ABSTRACT

Jalandhar is one of the important urban centre of Punjab. It is situated in Doaba region with latitudinal and longitudinal extent 31º 32′ N and 75º 57′ E respectively. The city has flourished at a very fast rate. According to Census 2011 the total population of the city was 8,62,886 persons out of which 457636 were males and 405250 females. The sex-ratio and literacy rate was 915 and 82% respectively. The solid waste of Jalandhar city is managed by Municipal Corporation of the city. The waste from various sources like houses, industries, streets and wards is collected but remains unmanaged at city level. Generation of solid waste in city per day is 480mtd. There are 2000 workers and 84 vehicles to regulate the solid waste. There are 650 Ragpickers present in the city who play a vital role in the management of solid waste. However, aforesaid human resource is still not sufficient. Even after tremendous efforts the solid waste management in Jalandhar city is not satisfactory because there are still open dumps, foul smell, diseases and poor aesthetic. Thus there is a need to develop strict policy and implementation strategies for managing solid waste. The present research paper is highlighting the present solid waste management scenario of the city. It suggests various measures for proper collection, segregation of solid waste produced in the city. Paper highlights the concept of 4R's i.e. Reuse, Regenerate, Recycle and solid waste as a Resource to achieve the path of sustainable development. Applications of this model in Jalandhar city really help the city to create healthy environment and hygiene living conditions.

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WASTEWATER TREATMENT THROUGH EXPERIMENTAL VSSF-CONSTRUCTED WETLANDS UNDER MONO-CROPPED AND CO-CROPPED CONDITIONS

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ABSTRACT

Water degradation due to wastewater and the associated heavy metals are a global concern and their removal is the key for sustainable reuse of wastewater. In this regard a research was conducted at ICAR-Indian Agricultural Research Institute, New Delhi, India to assess the potential of vertical subsurface flow constructed wetland (VSSF-CW) for treatment of heavy metals viz. nickel (Ni), chromium (Cr) and lead (Pb) from wastewater. Five different wetland macrophytes viz. Typha (T), Phragmites (P), Acorus (V), Arundo (A) and Vetiver(K) as mono-cropped system (microcosms) as well as their five co-cropped combinations viz. (TP), (PA), (KV), (AT) and (VT) along with Unplanted control(U) were evaluated for metal removal capacity applying with single metal spiked water. In fifteen months of operation planted microcosms had shown average removal efficiency of 70-87% for Ni, 62-79% for Cr and 85-89% for Pb. Compared to unplanted (control) in planted microcosms removal was found significant higher ($P<0.05$) by 17-23% for Ni, 33-48% for Cr and 10-17% for Pb.However, there was no significant improvement in the overall average metal removal efficiency of the co-cropped systems (83.2, 77.6 and89.8%) over that of the mono-cropped systems (86.5, 78.5 and 88.8%), at same metal concentration level. Of all plants and plant-combinations tested, Phragmites (87.8%) and Arundo (89.8%) based mono-cropped systems, Phragmites+Arundo (PA; 90.4%) and Vetiver+Vacha (KV; 88.4%) based co-cropped systems for Ni; Arundo (84.5%) based mono-cropped system and Arundo+Typha (AT; 89.33%) based co-cropped system for Cr and Vetiver (91.2%) based mono-cropped system and Vacha+Typha (VT; 93.5%) based co-cropped system for Pb appeared to be associated with the the highest system removal efficiencies.

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ROLE OF HIGHER EDUCATION IN ENVIRONMENTAL AND COMMUNITY DEVELOPMENT: A CASE STUDY OF MEHAL PANCHYAT OF DISTRICT HAMIRPUR OF HIMACHAL PRADESH

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ABSTRACT

Higher education can play a vital role in sustainable development of any nation. As environmental sustainability is becoming an increasingly important issue for the world, the role of higher educational institutions in relation to environmental sustainability is more prevalent for the society. Community development is an effective approach grounded in principles of empowerment, addition, social justice, self independence, work together and collective action. Rural community vitality depends on communities maintaining adequate infrastructure, having access to services, enhancing business and economic opportunities and establishing policy settings to foster outcomes. Education institutions are regarded as one of the primary agents of transformation towards development. It acts as a most important component in the all round development of individuals enabling them to greater consciousness and understanding of their social, political, economic and cultural lives. Education institutional is a process that improves the immediate condition of living and also increases the potential for living in future. Keeping in view the above said facts this present study has been design with the objectives: (1) to study the role of higher education for swatch Bharat Abhiyan (2) to explain the role played by youth of (Career Point University) for the community development (especially on Swatch Bharat Abhiyan) of adopted village of Mehal Panchyat. (3) To discuss the activities done by Career Point University for the betterment of Mehal Panchyat for environmental development. (4) to examines the efforts taken by higher education in environmental development in Mehal Panchyat of creating healthy environment and conservation of resources. The data for this purpose was collected through primary as well as secondary sources. An analysis of the data reveals and concludes that education institutions are playing vital role for Community Development, environmental protection in the society.

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HMX DEGRADATION BY *Paenibacillus Aestuarii* ISOLATED FROM AN EXPLOSIVE CONTAMINATED SITE

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ABSTRACT

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) is one of the major contaminants present in soil and water near its manufacturing and processing facilities. Remediation of HMX is necessary because of its toxic effects on the biotic and abiotic components of environment. HMX may affect health of humans and animals adversely and considered as a priority pollutant by USEPA (United States Environmental Protection Agency) and ATSDR (Agency for Toxic Substances and Disease Registry). There are many physical and chemical methods for remediation of this explosive like lime treatment, electrochemical treatment, chemical oxidation, hot gas decontamination and incineration which has their own advantages and disadvantages. Microbial degradation can be one of the sustainable options to solve the problem of pollution caused by this type of high energetic munitions compounds. In this study, we explored the potential of native microorganism (*Paenibacillusaestuarii*) isolated from an explosive contaminated site for degradation of HMX in aqueous phase. *Paenibacillus aestuarii* was cultured aerobically and degradation of HMX at maximum dissolved concentration was observed for 27 days in a laboratory scale experiment. Samples were withdrawn at a fix interval of time and analyzed by HPLC. A degradation of 81.4% was observed in 27 days. This study shows that *Paenibacillus aestuarii* can utilize HMX as sole source of nitrogen and is a potential degrader of HMX.

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FROM A POACHER VILLAGE TO A BIRDER'S PARADISE: A CASE STUDY ON COMMUNITY MANAGED ECOTOURISM INITIATIVES AT MANGALAJODI, ODISHA

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ABSTRACT

Erstwhile fishermen communities of *Mangalajodi* of Khordha district of Odisha were making their living mostly by catching fishes from the *Chilika* lake mouth at *Mangalajodi* and by illegal poaching of migratory birds. As time passed by, large scale poaching activities resulted in ecological imbalance, biodiversity degradation and with a lot more negative impacts gradually started becoming ardent threat for the future of biodiversity at this Birds Paradise. The alarming scenario gets a kind of rejuvenation with the introduction of ecotourism and related activities at *Mangalajodi*. This initiation employs more than 100 families of the nearby villages. The poachers eventually turned into protectors of biodiversity of the place. The present research studies the factors influencing the villagers in such a remarkable transformation from destructor of the environmentto get involved in a sustainable manner for protecting their environment with rewarding socio-economic-cultural development initiatives through ecotourism by the local community. The research also attempts to provide a framework of holistic integration among various stakeholders such as NGOs, travel operators, Govt. organizations, local community associations. *Mangalajodi Ecotourism Trust –a community managed ecotourism enterprise* in order to establish *Mangalajodi* as a successful ecotourism model in the Map of Odisha. The extent to which the socio-economic conditions and environmental growth have been realized so far and the likely solutions for the existing challenges for the community based ecotourism development at the destination have also been attempted to hit upon in this case study.

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HIGH SELECTIVITY OF CO_2 IN A LOW-COST GREEN SOLVENT

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ABSTRACT

Reducing global warming by carbon capture from the atmosphere with low-cost and environment friendly green materials is the primary motivation. For reduction of environmental pollution researchers and scientist are continuously working for the replacement of traditional volatile solvents with some low cost green solvents. Almost all chemical reactions are taken away in the comportment of a solvent. A new class of non-volatile solvent ionic liquids with their unique potential makes their place in the separation and chemical industries. An ionic liquid is an organic molten salt composed of cation and anion solution which are poorly coordinated, resulting in a low melting point often below 100°C.Ionic liquids have many important properties, such as high solvation nature, large electrochemical window, corrosion-preventing nature, high ionic conductivity, and negligible vapor pressure which make them superior over traditional solvents. Aromatic amine based ionic liquids are basically expensive and toxic which prevents their large scale study. We have synthesized, and filed a patent on a new low-cost aliphatic polyammonium-based protic ionic liquid with solvent-free acid-base neutralization method. In this paper its various physicochemical properties have been quantified and potential to separate carbon dioxide from flue gas has been searched. It is found that this novel ionic liquid is low cost and has the highest absorption capacity compared to all ionic liquids reported to date.

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AIR QUALITY STATUS OF AURANGABAD, MAHARASHTRA

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ABSTRACT

Air pollution is one of the greatest environmental evils. Urban air qualities are matter of concern of exposure of large number of people to it. This paper assesses the ambient air quality status in Aurangabad city. A statistical analysis of ambient air in Aurangabad city during the year 2014 - 2016 and its concentration of SO_2, NO_2, PM_{10} and SPM at selected three residential and commercial sites during rainy, winter and summer season were studied. The analysis of air quality in Aurangabad city for three years shows increasing trends of air pollution. The average concentration of PM_{10} and SPM at all locations in each year has exceeded the prescribed limit by NAAQS. Apart from this SO_2 and NO_2 levels remain under prescribed limit with minor fluctuations. The annual mean values for all sampling sites and the statistical calculation made on data shows SO_2 and NO_2 year wise and site wise significant and PM_{10} and SPM year wise non-significant and site wise significant. The values of almost all parameters were found to be higher at S.B. College while minimum at Collector Office, Aurangabad. This may probably be due to the heavy traffic and human activities at S.B. College as compared to that near collector office. Seasonal study showed maximum value of PM_{10} in winter and minimum in monsoon season. Higher winter concentration was attributed to low winds and low mixing heights leading to accumulation of pollutants. roads and building construction, open garbage waste burning and increase in road traffic including private as well as government vehicles responsible for emission of trace gases and particulate matter. Hence, development of strategic plan to control and mitigate air pollution is a cause of concern.

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IMPACT OF CLIMATE CHANGE ON THE HIMALAYAN FLORA

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ABSTRACT

Himalayas have reportedly warmed three times the global average during past few decades. The rising temperatures have resulted in varied impacts on the Himalayan ecosystems ranging from changes in phenology and community composition to decrease in agriculture productivity and extinction of species. However, species extinctions that have emerged as the foremost potential threat of climate change in the region. Here, I identify regions which are at the greatest extinction risk due to climate change in the Himalaya. I carried out sampling and ecological modelling studies in the Sikkim Himalayan region; the study area was divided into four sub-regions i.e. tropical (300-1500 m), temperate (1500-3000 m), sub-alpine (3000-4000 m) and alpine (4000-5300 m). In each of these sub-regions, field-based quadrat studies were carried out to collect data on endemic species occurrence and their elevational distribution ranges. Species distribution models (SDMs) were constructed using data on species occurrence and climate scenarios (current, 2050, 2070) as available from the Worldclim database. For each sub-region and climate scenario, the SDM results of all endemic species were summed up to arrive at measures of species richness. As compared to current climate, a total of 25 endemic species are likely to go extinct by 2050 and 29 species by 2070. The alpine region is likely to experience the highest species losses (15 by 2050; 19 by 2070), followed by sub-alpine (5 each by 2050 and 2070), temperate (3 each by 2050 and 2070) and tropical (2 each by 2050 and 2070) regions. This study highlights the vulnerability of alpine Himalayan ecosystems to ensuing climate change and need for urgent prioritization of conservation actions in these vulnerable regions.

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EFFECT OF CHANGING LIGHT ENVIRONMENT ON BEHAVIOR AND PHYSIOLOGY OF ORGANISMS

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ABSTRACT

Biological systems are organized foremost by light. The circadian clock is responsible for organizing the timing of multiple body systems. Responses to natural light cycles result in an adaptive temporal organization. With the invention of electric lights, the temporal organization has been severely altered. Recent rapid urbanization and changes in light environment particularly light at night may have important consequences for behaviour and physiology. The presence of light at night has significant social, ecological, behavioral and health consequences which adversely impact growth, metabolism and immunocompetence. The timing of breeding in animals can be altered by artificial lightning. The interruptions in critical reproductive behavior mediated by exposure to artificial lightning could exert significant fitness consequences. Rapid change in the light can affect the visual system of animals. Increased light at night is generally expected to increase the opportunities for visual perception for diurnal animals. Artificial nighttime light can alter the movement and activity patterns of individuals, which has consequences for the frequency and duration of social interactions (i.e., the social network structure). Reproductive synchronization is expected to decrease which will decrease the reproductive success. Thus, the overall changing light environment is detrimental to an organism's behavior and physiology.

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EFFECT OF FOLIAR APPLICATION OF GA_3 AND MICROELEMENTS ON VIGOR AND FLOWERING BEHAVIOR OF FRENCH MARIGOLD C.V BASANTI LOCAL

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ABSTRACT

Marigold (*Tagetes erecta* L.) is commonly used for cut and loose flowers in India because of ease in cultivation and adaptability to varying soil and climatic conditions, long duration of flowering and attractively coloured flower heads of excellent keeping quality. The significance of microelements in manurial schedule of horticultural crops has been recognized only in the recent years. Increasing interest has been observed in the use of P.G.R. like GA^3 in vigour promoting substances. However, information on the effect of GA^3 and microelements like zinc and Borax on ornamental crops is rather meager. Therefore, an experiment was conducted to study the influence of foliar application of GA^3, zinc and Borax on vigour and flowering behaviour of French marigold c.v. Basanti Local. Results of the field experiment revealed that vigour of marigold plant was significantly increased due to foliar application of GA3 and microelements. The production and size of floral heads were also improved significantly by the GA^3 and microelement treatments. The spray of 100 ppm GA^3 for 15 days after transplanting and of 0.50% $ZnS0^4$ for 30 days after transplanting proved significantly effective for a floriferous crop of French marigold c.v. Basanti Local.

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DIVERSITY OF MICROBIAL ENDOPHYTES IN DIFFERENT CROP PLANTS AND THEIR PATHOGENECITY AGAINST IMPORTANT INSECT PESTS

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ABSTRACT

Endophytes play vital role in reducing pest and disease load by imparting host defence mechanisms. Unique endophytes could be used directly to treat seeds or transplants for immediately protecting the crops against abiotic and biotic factors. Though several biopesticides are quite effective and can be incorporated in insect pest management programmes, there are several bottlenecks for their mass multiplication, requirement of humid climate and dose requirements. In recent years, entomo-pathogenic endophytes have been explored for pest management in various countries. The biological control of insect pests using endophytic entomo-pathogenic fungi, *Beauveria bassiana* (Balsamo) Vuillemin has been receiving greater research attention. The present investigations were conducted at Regional Agricultural Research Station, College of Agriculture, Vijayapur (Karnataka-India) during 2015-16 and 2016-17. The plant samples were collected from different location during different seasons and brought to the laboratory for further isolation and pathogenecity studies. The presence of entomo-pathogenic fungal endophytes and their identity has been confirmed in different agricultural and horticultural crops. As an endophyte, *Beauveria bassiana* was present in rabi sunflower, maize, chickpea, cauliflower, greengram, banana, citrus, tomato, brinjal, chilli, beans and pomegranate. Further, endophytic *B. bassiana* was evaluated for its pathogenecity against chickpea pod borer, *Helicoverpa armigera* (Hubner) and sorghum stem borer, Chilo partellus Swinhoe under laboratory conditions. The results indicated that endophytic *B. bassiana* has caused larval mortality of *H. armigera* and *C. partellus* to the extent of 63.30 and 60.00 per cent respectively at 7 days after treatment. Hence, endophytic *B. bassiana* present in different plants can be largely explored for the management of insect pest in eco-friendly manner.

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INFLUENCE OF INTERCROPPING ON ROOT-GALL NEMATODE DISEASE ON OKRA

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ABSTRACT

Six intercrops (maize, water melon, soybean, bitter gourd, *Amaranthus* and red pepper) were tested for control of root-gall nematode disease on okra in a loamy sand soil naturally infested with Meloidogyne javanica. The experiment was laid out in a randomized complete block design replicated four times. Results based on root-gall indices and number of juveniles (J_2) recovered from roots and rhizospheric soil showed that intercropping of soybean, red pepper and *Amaranthus* effectively suppressed infection on okra roots. Soybean, maize, bitter gourd and watermelon intercropped with the okra aggravated root-gall damage and caused yield reduction.

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CONSTRUCTED WETLANDS - A SUSTAINABLE SOLUTION FOR LANDFILL LEACHATE TREATMENT

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ABSTRACT

The concentrated leachate from landfill sites is a major threat to aquatic ecosystems and public health. This paper presents an overview of the use of constructed wetlands for remediation of landfill leachate. The constructed wetland is a relatively novel technology with great potential for environmental remediation. The constructed wetlands have been extensively studied for treatment of diverse type of wastewater. They have been found highly effective for the remediation of bio-refractory organic compounds, plant nutrients, as well as hazardous heavy metals. The treatment process mechanism, parameters, plant species, and performance for removal of pollutants from landfill leachate are to be evaluated. The constructed wetlands may provide sustainable solution for treatment and management of landfill leachate.

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SUSTAINABLE DEVELOPMENT–MINIMIZING ENVIRONMENTAL DEGRADATION

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ABSTRACT

Sustainable development is a socio-ecological process characterized by the fulfillment of human needs while maintaining the quality of the natural environment indefinitely. It is only through new sustainable approaches to development that the planet's fragile ecosystems can be protected and the aims of human development be furthered. The goal of environmental sustainability is to minimize environmental degradation and to halt and reverse the processes they lead to. This paper deals with an approach to sustainable development emphasizing the need for new conceptions of global development that take cognizance of the fact that social and environmental problems are interconnected. One of today's environmental challenges is to find ways of strengthening the scientific and socio-economic perspectives to help authorities make decisions and produce sustainable development strategies with a vision for future. The Government has emphasized the need for a coordinated approach to sustainable development in India and around the world. This is also evident by its action on climate change, human health and the environment; its support for the building and maintenance of green infrastructure in and its recognition of the unique relationship tribal people have with the natural environment. The strategies will identify common goals and actions towards ensuring healthy human and natural environments, supporting emerging governance systems, advancing appropriate use of natural resources, building vibrant communities and influencing international activities. Sustainable Development is about a more inclusive society, which provides for better protection of the environment and use of natural resources and shares the benefits of economic growth as widely as possible.

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CORN SHELLER MACHINE

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ABSTRACT

This paper investigates low cost manufacturing of a *corn sheller* machine to shell corn kernels of the cob for its various applications. An attempt has been made successfully for developing low cost (Rs. 3000) hand operated corn sheller machine for its application in hotels, commercial vendors and households. The commercial corn sheller machine is available at higher capacity at the cost of Rs.25000 with 10 to 20 HP running power for production of 5000 kg/h. However, the developed working corn sheller machine is hand operated and cost Rs.3000 with production capacity upto 60 kg/h. In this paper design and fabrication process is explained for various components of the corn sheller machine e.g. feed hopper, shelling disc, springs, hand lever etc. The performance of the machine was studied in terms of capacity to handle number of corn grain sticks with size in the range of 15 to 18 cm with output about 60 kg/h, ways to improve shelling efficiency, and corrective measures for low down time and minor maintenance issues. This product developed can be operated continuously for a comparatively long time with high shelling rate without causing damage to kernels. The developed product can be easily handled and helps in enhancing the farmer especially women empowerment in the villages as well as city.

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THE GEOPOLITICS OF NEW ENVIRONMENTAL CHALLENGES: AN OVERVIEW

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ABSTRACT

Environmental issues have been continuously ascending the ladder of political relevance to become, during the past two or three decades, an integral part of any political equation. This is true for local, regional and national levels, which have seen a permanent greening of their respective political patterns, as well as for the international political scene. These shifts correspond to the broad recognition that environmental problems are international and global. Geopolitical conceptions of the environment, it shows that power is fully implicated in how the environment is represented and used for specific geopolitical agendas/interests. In moving beyond critique, there is a focus on recent "planetary" thinking and how it enables critical geopolitics to advance socially and ecologically just geopolitical responses to the environment. The Climate change and global warming for international politics in general and international security in particular Challenges in the world. The weather and in what way climate change may alter the conditions of international security. From this perspective, the initial effects of climate change will vary according to existing economic, political and social structures in different world regions. Climate change is unlikely to lead to an increase in conflicts in the short- to medium term, but a long-term development marked by unmitigated climate change could very well have serious consequences for international security. Environmental degradation and natural-resource insecurity are undermining our ability to tackle some of the biggest global issues we face.

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EFFECT OF BIO AND CHEMICAL INSECTICIDES ON THE STORABILITY OF GREEN GRAM SEEDS

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ABSTRACT

In order to understand the effect of different bio-insecticides and deltamethrine on the storability of *Vignaradiata* var. PDM139, the seeds were treated separately with six bio-insecticides viz. eucalyptus oil (5 ml/kg seed), castor oil (5 ml /kg seed), neem leaf powder (5 and 10 g/kg seed), nemazol (2.5 and 5 ml/kg seed), turmeric powder (5 and 10 g/kg seed), lantana leaf powder (5 and 10 g/kg seed) and one chemical insecticide namely deltamethrine (0.04 and 0.08 ml/kg seed). Which were then packed in cloth bag in three replications and stored for eight months (August 2014 to April 2015) under ambient conditions (range of temperature 12.53OC to 29.87OC and R.H. was 44.29% to 80.46 %) at seed testing laboratory, DSST, CSAUA&T, Kanpur. For maintaining highest germination, vigour and field emergence of green gram seeds var. PDM-139, the seed treatments with deltamethrine @ 0.04 ml/kg & 0.08 ml/kg were found best. The bio-insecticide treatment namely nemazol @ 5 ml/kg seed may be replaced the use of deltamethrine successfully, as it is not only eco-friendly and non-hazardous over deltamethrine but also showed significantly at par performance for field emergence (78.71%), seedling length (19.50cm), seedling dry weight (0.19gm), test weight (37.31gm) and seed volume (4.17cc) and stood on second place for germination (83.69%), seed vigour index – II (21.46) and seed density (1.06g/cc) when stored for 8 months in packaging of cloth bag under ambient storage conditions of Kanpur{U.P.}.Besides above insecticides, eucalyptus oil @ 5ml/kg seed may also be used for maintaining optimum germination (84.98%) and field emergence (77.39%).

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URBAN AGRICULTURE AND ITS IMPACT ON ENVIRONMENT

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ABSTRACT

Urban agriculture refers to growing of plants and the raising of animals within and around cities. Urban agriculture is mutually recognized by some as an activity that is marginal and short term. Some favor it as an activity that is actually detrimental to farmers, consumers, the environment, the urban land economy, and the aesthetic beauty of a city. The most remarkable feature of urban agriculture, which differentiates it from rural agriculture, is that it is integrated into the urban economic and ecological system: urban agriculture is embedded in -and interacting with- the urban ecosystem. Such bonds include the use of urban residents as laborers, use of typical urban resources (like organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc. Urban Agriculture plays an important role for making a city more spirited and safe in term of not only food and economy but also improving standard of living of urban poor by increasing mean of livelihood. Urban agriculture impacts a community in a variety of ways, from providing food security, environmental benefits, and even modifying a city's urban form. Some of the problems encountered due to urban agriculture are: Health and hygiene, environmental effects, inefficiencies and aesthetic problems. A holistic approach is required to sort out the challenges being faced by urban agriculture.

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MUSEUM FOR ENVIRONMENTAL COMMUNICATION AND CREATING PUBLIC AWARENESS

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ABSTRACT

There are a number of activities which a museum performs for the society, but we focus our attention on how important is the role of communication is in a museum. The definition of the museum by ICOM defines Museum an institution in the service of the society and its development and communication is one of its basic and primary functions. It is a media through which a museum connects to public as every object or exhibit says something and communication success depends on how well the public understand its meanings. The role of museum as communication is greatly varied as it includes communicating information in different way for the understanding of visitors of different age groups. Every day new information about environment is generated through different media and try to prove a continuous challenge for museum to communicate it to the people in an interesting and usable form which results in action .Museum communication provide a free choice learning environment for visitors hence creating a greater after effect in public This paper emphasize on the role of museum a communication tool for generating public awareness and describes the importance of a smuseum in creating environmental awareness and to provide environmental education.

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GREEN ECONOMY: AN INDIAN PERSPECTIVE

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ABSTRACT

Green economy is gaining ground across the world and India is no exception. India is a signatory to the Millennium Declaration adopted at the United Nations General Assembly in September 2000. In fact green economy concept has a greater significance in India, because despite being an economic strength, India is a poor economy. Along with economic development, we need to attain ecological sustainability. Sustainable development is the form of development which aims at sustainable consumption and sustainable economic growth and tries to protect the environment. The field of sustainable development can be conceptually broken into three constituent parts: environmental sustainability, economic sustainability and socio-political sustainability. Environmental sustainability is the process of making sure current processes of interaction with the environment are pursued with the idea of keeping the environment as pristine as naturally possible based on ideal- seeking behavior. The economic development should not only be efficient but also fair. India needs an inclusive growth. Poverty eradication is the most important step in this direction. Such programmes will promote both social as well as economic justice. To attain the desired, we need many fiscal reforms. The government needs to make special provisions in budgetary expenditure for green economy initiatives. Our reforms will affect employment, trade, agriculture, manufacturing, service sector, business patterns and every other economic unit. Growth is not limited to these reforms. We need to develop a social structure for the same. People need to be made aware. They should have such an ideology that they accept and accumulate those changes. Both knowledge and skill needs to be developed. There should be a special emphasis on research and development to innovate new and better ways of doing things which equally benefit environment. The concept of green economy strongly need a base to work upon. It should be as quick as possible because we are facing a high rate of depletion of resources. The main cause of resource depletion is population growth. The population of India has grown to an alarming rate. We need to control it and achieve a dynamic equilibrium between economy and resources. Our transformative actions should aim at reviving economy, saving and creating jobs, reducing risk from carbon, protecting vulnerable groups, preventing and reducing ecosystem degradation, technological advancements, poverty eradication (social and economic justice) and promoting sustainable and inclusive growth. Green economy concept is more or less like structure of an hourglass. Beginning from diverse goals of different sectors, we need to converge to our ultimate goal i.e. 'A Green Economy'. It will again yield diverse benefits to different sectors of the economy. But all it needs is a paper to practical approach.

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SUSTAINABLE DEVELOPMENT: GLOBAL CHALLENGES

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ABSTRACT

Climate change is one of the most important global environmental challenges facing humanity with implications for food production, natural ecosystems, fresh water supply, health, etc. According to the latest scientific assessment, the earth's climate system has demonstrably changed on both global and regional scales since the pre-industrial era. This unprecedented increase is expected to have severe impacts on the global hydrological system, ecosystems, sea level, crop production and related processes. The impact would be particularly severe in the tropical areas, which mainly consist of developing countries, including India. The paper comprise of climate change issue that is a part of the larger challenge of sustainable development. The impact of climate variability and change, climate policy responses, and associated socio-economic development will affect the ability of countries to achieve sustainable development goals. The pursuit of these goals will in turn affect the opportunities for, and success of, climate policies. In particular, my paper will be focusing on the socio-economic and technological characteristics of different development paths will strongly affect emissions, the rate and magnitude of climate change, climate change impacts, the capability to adapt, and the capacity to mitigate. The issue of highest importance to developing countries is reducing the vulnerability of their natural and socio-economic systems to the projected climate change. India and other developing countries will face the challenge of promoting mitigation and adaptation strategies, bearing the cost of such an effort, and its implications for economic development.

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MANAGING PLASTIC WASTE: A HUGE CHALLENGE

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ABSTRACT

Huge quantities of plastic waste are generated each day. Important strategy to consider in this regard is to rethink, rediscover, regenerate, reuse, reduce and recycle. The paper highlights the importance of retrofitting and redesigning of ways of usage in order to fulfill the objective of the study which focuses upon the ill effects of the waste creation and how one can rebuild ways of getting rid of the existing harmful phenomenon which can impact us in more harmful ways than we can even imagine. The study also elaborates upon the methods of using or reusing and how innovatively one can meet the challenging present scenario.

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CROP HARROWING MACHINE

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ABSTRACT

Weeding is an important agricultural sector operation. Delay and negligence in weeding operation affect the crop yield up to 30 to 60%.The removal of weeds is useful because the unwanted plants or weeds consume water as well as nutrients and occupy larger space on the field. Weed control is commonly done in an early crop stage being smaller in size and more effective. The developed crop harrowing machine reduces human effort for weeding as compared to operation by using bullocks which require lot of human effort e.g. hand and body pressure to achieve depth. The developed weeder requires less human efforts and it can be self-guided. This reduces human drudgery to a great extent when weeding has to be carried out for small as well as large farms. This reduces the operational time and achieves timeliness in operation. The maintenance of the developed weeder is easy and ideally suited for mechanizing small farm holdings which accounts to 80 % of the total farm holdings in the country. Cost wise the weeder is affordable limited to Rs.12000 per weeding machine for ease in the weeding farm operation and no dependency on costly farm labour for the weeding farm operation. The developed weeding machine requires about 2 h for 1 hectare of farm land where as for bullocks it requires 4 h of weeding operation on farm lands.

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ENVIRONMENTAL ETHICS, RELIGION AND CULTURE

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ABSTRACT

Religion is sometimes defined as the relationship between people and that which they regard as holy, often in supernatural terms. There is a close relationship between religion and environment. Religion has had major positive influences on the natural environment. Buddhism teaches that respect for life in the natural world is essential, underpinning the interconnectedness of all that exists. Jainism, one of the oldest living religions, teaches ahimsa (non-violence) towards human beings and all of nature. It believes in the mutual dependence of all aspects of nature belonging together and bound in an intricate relationship. Environmental ethics may be defined as a set of norms describing how humans should behave toward nature and its resources. Such norms are often based on a moral attitude revolving around what is perceived as good or bad. The environmental crisis facing humanity is deeply rooted in a complex web of economic, social and cultural factors, as well as belief systems, social attitudes and perceptions. Some values of human behavior shape environment. Cultures of different religion also affect our environment. In this paper are described the effects of norms set by ethnic person, different culture, different religion on our environment.

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CAN WHOLE BLOOD GLUCOSE UPTAKE BE USED FOR DETECTING INSULIN RESISTANCE INDUCING PROPERTY OF ORGANOCHLORINE PESTICIDES?

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ABSTRACT

Serum/plasma glucose level decreases by 3-5% per hour due to uptake of glucose by the blood cells, when blood was kept after collection. Sub-chronic exposure to organochlorine (OCs) pesticides e.g. Dichlorodiphenyltrichloroethane (DDT) and gamma-hexachlorocyclohexane (Lindane) are claimed increase the risk of development of insulin-resistant state and type 2 diabetes mellitus (T2DM). The effect of DDT and lindane, the prototype OCs on glucose uptake by whole blood is not known, but a development of tool for screening insulin-resistance inducing properties of pesticides are important. Hence, we performed an *in vitro* experiment to explore the effect of various concentrations of DDT and lindane on glucose uptake by whole blood cells. In vehicle (1% dimethylsulfoxide i.e. DMSO) treated heparinized blood, plasma glucose level was decreased by 7.1% and 13.5% at 2 and 4 hrs respectively after collection.

Addition of DDT (0.01, 0.1, 1.0 and 10.0 mg/L) and lindane (0.07, 0.7, 7.0 and 70.0 mg/L) dissolved in DMSO (final concentration 1%) in blood change the rate of reduction of plasma glucose by maximum 5 and 10% in 2 hrs and 4 hrs in heparinized blood. Hemolysis assay showed that with 10 mg/L DDT, 6% and 12% hemolysis occurred at 2 hrs and 4 hrs respectively and with 70 mg/L lindane these were 5% and 12% respectively. The reduction in glucose uptake by whole blood is due to its hemolytic effect. Toxicity per se did not influence rate of glucose uptake. Hence, we conclude that whole blood cannot be used as a screening tool for insulin-resistance inducing property of pesticides.

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GREEN ENVIRONMENT AND CORPORATE SOCIAL RESPONSIBILITY: AN EMPIRICAL REVIEW

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ABSTRACT

The effect of environmental policies on the economy has always been a controversial topic and social accounting also known as social accounting and auditing, social accountability, social and environmental accounting, corporate social reporting, corporate social responsibility reporting, non-financial reporting or accounting is the process of communicating the social and environmental effects of organizations' economic actions to particular interest groups within society .There are many environmental issues in India like air pollution, water pollution, garbage and pollution of the natural environment are all challenges for India. Nature is also causing some drastic effects on India. For this corporate social responsibility is introduced and implemented in Companies Act 2013 as a corporation's initiatives to assess and take responsibility for the company's effects on environmental and social wellbeing. Major environmental issues are forest and agricultural degradation of land, resource depletion (such as water, mineral, forest, sand, and rocks), environmental degradation, public health, loss of biodiversity, loss of resilience in ecosystems, livelihood security for the poor. The major sources of pollution in India include the rapid burning of fuel wood and biomass such as dried waste from livestock as the primary source of energy, diversion of consumer waste into rivers, cremation practices near major rivers, government mandated protection of highly polluting old public transport, and social issues such as Growing Population, Poverty, Development and Forests etc. For this the new concept of Green Entrepreneurship has emerged which means the activity of consciously addressing an environmental/social problem/need through the realization of entrepreneurial ideas with a high level of risk, which has a net positive effect on the natural environment and at the same time is financially sustainable.

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WATER POLLUTION AND LEGISLATIONS IN INDIA: A STUDY

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ABSTRACT

What is water? Like said in very famous quotation "Jal hi Jeevan? Its mean we can say water is another name of life. Why so? Answer will be water is very important element of life not only for human being but for every living creature in world. If water is that much important than we human have duty to save water not for own self but for everyone but we human in spite of ignoring this fact polluting the water by every possible means whether by domestic waste or by factory hazardous waste or by throwing waste in river or canals. Ganga is big example of water pollution. We made Ganga that much polluted that there are several articles which declared that taking bath in Ganga is very dangerous for human being. Gangotri project was started by our government but still we did not get any satisfactory result. The answer is first judiciary has to implement water pollution laws in a stringent manner like they legislate for real purpose and second to spread awareness among the people about the value of water and how to stop polluting water. In this paper the source of water pollution, kinds of water pollution, reason of water pollution, and effect of water pollution and laws and judiciary response to deal with this problem.

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DESIGN AND COMPARATIVE STUDY OF SOLAR DRYERS

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ABSTRACT

Solar drying has gained popularity in many parts of the world. They can be easily maintained and utilizes solar energy for its operation. Hence, there is investment cost for developing the solar dryer and minor cleaning and maintenance cost but no cost for operation. This paper presents the design for constructing of two types of solar dryers namely, Greenhouse solar dryer and cabinet solar dryer and comparison of their experimental performance. The designs of both dryers were based on the geographical location and meteorological data The cabinet dryer consists of the solar air collector (as air heater) and a solar drying cabinet chambers separated by wire mesh in the form of trays which can be removed for cleaning, loading and unloading food products to be dried. The cabinet dryer contains rack of three trays lower high temperature zone, middle medium temperature zone and upper lower temperature zone. The ambient air flows into the cabinet through the outside end of the attached solar air collector due to buoyancy force generated because of density difference (hot air with low density flows up). When hot air flows up through the cabinet it dry the food products kept on the trays by removing the moisture content from the food substance or agricultural produce loaded. Similarly in case of the Greenhouse solar dryer, the solar energy directly falls on the greenhouse developed with three trays made of wire mesh, with upper tray as high temperature zone, middle tray as medium temperature zone and lower tray as low temperature zone. The developed solar dryer was constructed using locally available materials for its low cost and wide acceptability among common users in the household, farmers and industries involving drying process. The maximum temperature in the month of April 20, 2018 was 45oC and 40oC in case of Greenhouse and Cabinet dryer when ambient temperature was 34oC. The drying time for mint leaves of 60 g to 20 g was observed as 3.5 h with exhaust flow at 1.7 m/s through two circular openings of 10 cm diameter.

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EFFECT OF LIGHT INTENSITY AND DIETARY VITAMIN-C SUPPLEMENTATION ON THE PHYSIOLOGICAL RESPONSES OF *Labeo Rohita* LARVAE

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ABSTRACT

Environment plays an important role in the life of aquatic organisms, especially in larviculture. Light intensity is a key limiting environmental factor that elicits differential response in fish at various developmental stages. Light that is too intense may be stressful or even lethal. Dietary vitamin-C supplementation enhances non specific immunity and improves stress resistance as it acts as a free radical scavenger. Larvae (0.134±0.006 g) were exposed to different light intensities of 114±4, 2676±409 and 3442±648 lx. In one set of experiment, larvae were fed with basal diet without vitamin-C supplementation and in another set they were fed with vitamin-C supplemented diet. Fish were harvested after 90 days and tissue samples were collected for various assays. A direct relationship was found between the light intensity and various antioxidant enzyme systems. Glutathione peroxidase (GPx) and glutathione S-transferase (GST) activities were significantly ($P<0.05$) higher in fish cultured under light intensity of 3442±648 lx compared to the other treatments. Exposure of larvae to higher light intensity resulted in oxidation of lipids and proteins as malondialdehyde and carbonyl protein levels were highest in larvae exposed at maximum light intensity. Serum cortisol and glucose levels showed the similar trend. Dietary vitamin-C supplementation significantly reduced the negative effects of light stress. High light intensity causes stress in rohu larvae, thereby it affects the physiology of the cultured species. Dietary supplementation of 0.6% vitamin-C mitigates the light stress.

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EFFECTS OF WASTES DISPOSAL ON STREAMS AND SEWAGE SYSTEMS

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ABSTRACT

Rapid population growth has brought revolution in modern technology and improved human life tremendously. From agriculture to transport sector to industrial production houses, domestic households, each sector is incessantly and indiscriminately disposing inadequately treated solid, liquid and gaseous wastes into the open environment and contributing greatly into escalation of environmental problems like land, water and air pollution, which eventually turns into biodiversity loss, ecosystem collapse, and climate change and ultimately leads to threats to the existence of human being. This review focuses on the effect of disposing of waste materials into the river streams and sewage systems. Water is the most important component of the environment but it is also most poorly managed resource in the world. Various effects such as plugging, drastic variability in pH, odour, colour and temperature, electrical conductivity, total dissolved solids, dissolved oxygen, biological and chemical oxygen demand, change in concentrations in copper (Cu), cadmium (Cd), iron (Fe), lead (Pb) and zinc (Zn) can be attributed to mixing of waste materials into river streams and sewage systems. A stream and sewage systems must, therefore, be monitored, evaluated and protected regularly so that it can serve the best interest of people using it. Methods focus on maintaining the effluent standards going mixing up with the stream and sewage systems. Treatment of waste before discharge should be made mandatory to all waste generating sources irrespective of their size and locations. The stream quality should be established in accordance with the designation of the water body. Loading/mixing should be permitted to a level what a stream can assimilate. In case of excessive pollution or overloading, the effluents should be treated or upgraded before discharge into the stream. In this regards, the harmful effects of industrial effluents and solid waste on the quality of water need to be checked to ensure water quality, public health, and their well-being.

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ENVIRONMENTAL IMPERATIVE FOR CITY SANITATION PLAN: MEERUT URBAN AREA

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ABSTRACT

The present study discusses the raised sanitation problems in Meerut urban area, which is caused due to various urban activities that is poor water management, wastewater management, solid waste management and inadequate toilet facility, which degrades the environmental quality and making it one of the filthiest urban areas in India. Due to continuous extraction and dependency of groundwater for urban water supply and increased demand for industrial sector for manufacturing of quality goods causes depletion of groundwater table. Inadequate sewerage system leads to flow of municipal sewage and industrial effluent into the storm water drains without any prior treatment, as there is no wastewater treatment plant; these drains cris-cross the length and breadth of the urban area and contaminate the groundwater. On another part, solid waste management is the critical aspect as there is no scientific landfill site, so there is no segregation, recovery and reuse of waste, which is disposed off into the vacant land. Open defecation is also a major issue in the slums as the insufficient and dilapidated community and public toilets in the urban area. The present study highlights the stress area and formulates the various strategies, plans, policies and scientific approaches towards the improvement of Sanitation issues including water, wastewater and solid waste management and proper channel of toilets facility which makes Meerut urban area open defecation free, livable with a good hygienic condition and a better environment.

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RELATIVE MEASUREMENT OF APTI OF ROADSIDE PLANTS TO AIR POLLUTION STATUS

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ABSTRACT

Air pollution has become one of the major challenges of Environment as no one can yield fresh ambient air. Plants are most important species as they balance the ecological system of an environment. Trees naturally clean the environment and help in reducing air pollution. The selection of suitable tree species depends on the response of trees to air pollution and can be understood by analyzing the factors that determine their resistance and susceptibility. The present study evaluated air pollution tolerance index (APTI) at air monitoring stations are being classified as a sensitive area with respect to air pollution. *Plumeria*, Ashoka (*Polyalthia longifolia*), *Ficus benjamina*, and bougainvillea are taken. Air pollution tolerance index is an important parameter for evaluating the plants and trees which tells us their resistance and tolerance level against pollution. APTI have four parameters i.e Relative water content, Ascorbic acid content, Total Chlorophyll and pH. By knowing these four parameters, we calculate the APTI of any trees species which give us their tolerance level against pollutions. Relative water content gives us the amount of water holding capacity of the leaves which are highly effective against pollutants. The other parameter shows us how the plant/trees react to the pollutants depending on their level of content. Based on APTI values, tolerant and moderately tolerant plants are recommended for green belt development and air pollution attenuation.

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RELIABILITY OF PHOTOVOLTAIC SYSTEM

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ABSTRACT

In this paper, investigation was carried out based on the various case studies on life of the crystalline silicon PV systems. The warranty period provided by the manufacturers typically range from 20 to 25 years for crystalline silicon modules. The end of lifetime (for example, the time-to-degrade by 20% from rated power) of PV modules is usually calculated using a simple linear extrapolation based on the annual field degradation rate (0.8% drop in power output per year). There is significant changes in construction materials and design of PV cell manufacturing and efficiency in the range of 12 % to 45 % which makes old generation field data obsolete but helps in making predictions on the old designs/materials. The life of PV system is steadily improving from 5 year (1987) to 30 years (2017). The PV systems are installed at tilt angle equal to latitude of the place for year-round optimum generation (e.g. Delhi 28.6o and Pune 18.5o). The efficiency degradation rate of PV modules is at the rate of 0.2 to 0.5 % per year and reducing downdue to new materials and techniques of manufacturing for solar cells and system components. The cost of production has gone down since the inception of the PV cell technology USD 76.67 (1977) to USD 0.3 (2017) with PV system installation cost reduction USD 12000/kW (1977) to USD 5000/kW (2017). This makes it a promising solution at present or near future especially PV systems for rooftop installations over the buildings and PV water pumping in farm lands. The future of PV system installation cost will drastically reduce to USD 1000/kW by the year 2022 as predicted by Clean Edge Research. The cost of PV electricity generation USD 0.35/ kWh which is higher than conventional power source available at USD 0.2/kWh (1 USD= Rs.67.46). However, the unsubsidized conventional power source make the solar PV power system as promising and many roof top installations are becoming popular in India.

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ORIGIN OF SUSTAINABLE DEVELOPMENT AND CURRENT AND FUTURE POLICIES OF INDIA

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ABSTRACT

India has played a major role in the sustainable development of the world and has always been committed to the sustainable development goals. This paper deals with the true sense of the term "Sustainable development" for developing and developed countries and to different sectors of society. Sustainability must be goal and action oriented, beyond technical fixes, integrative, and in-cooperative of all the sectors of society. It also includes the origin of concern for the need of change in the current policies of the time during the Brundtland report, "Our common future" and the concerns, institutional changes and solutions highlighted by it. The need of sustainable development to the world and especially to India is also highlighted. The major challenges faced by the Indian government and the recent steps taken by the government along with the methods devised to approach sustainability and accelerate the process have also been noted. The involvement of various sectors of society including women, youth, indigenous folks, scientist and technologist etc and the role of government , private, local sectors and non-governmental organization. Here we also mention the tools that are required to achieve and mark the progress in sustainable development. The process requires the strengthening of major groups of society. This paper concludes with providing a solution to achieve sustainable development with all its characteristics. Achieving the goals of sustainable development is an enormous task, a different and innovative form of interactive cooperation between public, government and society to achieve the goal.

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AIR QUALITY MODELING USING REMOTE SENSING TECHNOLOGY

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ABSTRACT

The world is urbanizing at an alarming rate. In developing countries like India, urbanization and development usually start and proceeds in an unplanned way. This unplanned and uncontrolled urbanization leads to ecological imbalance, and ultimately, ecological collapse. This not only leaves adverse effects on the ecology of the area, but may also convert the area into a multiple hazard prone zone. Of all the hazards that our ecology is prone to in today's environmental scenario, air pollution has become a major concern. The deteriorating air quality has become a high priority with respect to regulation of environment that we live in today. Deterioration of air quality in most of the large cities in India has majorly been a condition driven by industrialization, uncontrolled growth of population, and increased dependence on automobiles. Clean healthy air is the primary prerequisite for a healthy and long-term sustenance of humankind and of the ecosystems that sustain the humankind. Keeping this in view, an attempt has been made to develop a GIS model which will help conveniently obtain air quality information directly from remotely sensed data. The paper demonstrates the potentiality of remote sensing for air quality monitoring and methods of linking satellite derived data with the ground truth data, by using GIS as the aiding tool. Remote sensing data of Landsat 8 OLI/TIRS Collection1 Level1 was acquired from USGS earth explorer for April month of years 2013, 2015 and 2017. Historical ground truth data for the same time span as of the remote sensing data was collected for the research study. Image processing and statistical were also used to create the model by using data from year 2015 to predict air quality statistics for future.

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GREEN HUMAN RESOURCE MANAGEMENT: AN INNOVATIVE WAY TO DEAL WITH ENVIRONMENTAL CONCERNS

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ABSTRACT

India is regarded as the world's biggest democracy and the second most populous country in the world. India is experiencing remarkable growth politically, socially and economically. During the past decades Indian economy has expanded to 57 lakh crore from mere Rs 2.7 lakh crore. However, this rapid pace of development has not come without serious environment costs. To deal with this problem the business entities across the country and around the world are coming up with policies and practices that encourage sustainable development. This paper largely focuses on one of such practice – Green Human Resource Management . Green Human Resource Management refers to formulating and using Human Resource Management policies in such a way that promotes sustainable use of resources and conservation of environment .Nowadays , Green HRM has became a vital strategy for integrating Environmental Management and Human Resource Management . This paper contributes to the existing body of knowledge by drawing together extant literature available and providing a theoretical and conceptual framework to fill the identified gaps in the body of knowledge related to the process of Green Human Resource Management in India. The aim of this paper is also to explain the growth and importance of Green Human Resource Management in India as well as the challenges in front of it. The study suggests the relative impact of Green Human Resource Management on the motivation level of employees in India and how the management can effectively involve them in Environmental management. This paper also studies the extent of corporate social responsibilities that the companies in India intend to fulfill through Green Human Resource Management. The study is done primarily on the basis of secondary data. The study suggests that there is further scope of utilizing the full potential of Green Human Resource Management in India.

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CURRENT SCENARIO ON ENVIRONMENT

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ABSTRACT

The key to man's health lies largely in his environment. In fact, much of man's ill health can be traced to adverse environmental factors such as poor housing, lack of water, sanitation facilities; garbage and waste water disposed facilities etc. which poses a series of threats to the health of slum dwellers as they spend much of their time in and around the unhygienic environment. Environment change is one of the most critical global challenges of our times which through a multitude of impacts pose a risk to our ecology, economy and society. It's caused by factor such as increasing population, rapid industrialization; urbanization and extensive use of natural resources. This paper will focus especially on Natural forest areas which have undergone change due to various reasons which includes agriculture expansion, infrastructure development, wood extraction, climate changes, population pressure, and poverty. At present, when there is debate going on global climate change, this natural resource is providing environmental services and as potential carbon-sink. Forests are the LUNGS of Earth. The Lungs are shrinking due to unfair human activities like Deforestation. From a human perspective, the rapid climate change and accelerating biodiversity loss risks human security as well.

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ENVIRONMENTAL AUDIT: OPPORTUNITIES AND CHALLENGES

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ABSTRACT

Companies can assess the impact of their operations on environment through environment audit. Though it is not mandatory in India, but it is an emerging area where positive results bring many benefits to the company which underwent EA such as smooth environmental clearances; advanced ISO certifications and stakeholder value creation. The objective of this paper therefore is to examine the scope of current environmental concerns and to investigate the preparedness of auditors in India to carry out environmental audit and various opportunities and challenges that is faced by them. It also examines the various benefits of EA to companies but several challenges related to the scope and manner of conducting Environment Audit are also studied.

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EVALUATION OF SEED ENHANCEMENT TREATMENTS IN MAIZE

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ABSTRACT

An experiment was conducted to evaluate the effect of different seed enhancement treatments on seed quality attributes and field performance of different maize genotypes namely; DHM-117, PRIYA, HQPM-1, PRAKASH, VQPM-9, AMBER POPCORN. The seed of maize genotypes were treated with following pre sowing seed treatments, hydropriming (17hr /20˚C), halopriming (3% KNO3 17hr /20˚C), matrix priming with (vermiculite 24hr /20˚C), biopriming (*Trichodermaviridae*@10g /kg seed) along with untreated control. Results revealed that all the genotypes had high germination (>90%) and vigor under lab conditions. Seed germination undertaken at different temperatures i.e. 15˚C, 20˚C and 25˚C; showed that seed germination under 25˚C was found best followed by 20oC for screening efficacy of seed enhancement treatments in maize. The seed enhancement treatments significantly improved field emergence, speed of emergence and seedling vigour, early vegetative growth (evident by higher fresh and dry weight of seedlings), plant height in treated seeds. Seed enhancement treatments also preponed flowering by 1-2 days and reduced ASI interval in treated seed. Differential response was observed among genotypes for seed treatments. Sweet corn, popcorn and quality protein maize were more responsive to seed enhancement treatments as compared to DHM-117 under field conditions. Effective seed enhancement treatments identified were hydro priming (17h /20˚C) and halo priming 0.3% KNO_3 17hr/20˚C which can be utilized for improving field emergence, crop growth and manipulation of flowering during hybrid seed production.

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POTENTIAL OF ORGANIC CONTAMINANT UPTAKE BY GASIFIER BIOCHAR

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ABSTRACT

The purpose of this study was to investigate biochar created in field conditions for its potential as an environmentally sustainable, affordable alternative to activated carbon in decentralized, community-based water filtration in developing countries. Organic contamination is an often-overlooked challenge in the WASH (Water, Sanitation, and Hygiene) sector. Moreover, the abundance of waste biomass in India lends itself to possibilities of biochar production by communities as waste management. Biochar was prepared from coconut husk in a Top-Lit-Up-Draft gasifier constructed from scrap metal at high temperatures. It was tested in the laboratory for uptake of phenol at concentrations of 10 ppm, 200 ppm, and 500 ppm. Biochar and phenol solutions were incubated in 1:3 ratios in batches and UV spectra obtained at 0 hours, 15 hours, and 20 hours in a UV spectrophotometer. The concentrations of the solutions were calculated from the absorbance at peak wavelength of phenol. The resulting concentration of phenol had decreased on subjecting the spiked solution to biochar treatment in all cases. The uptake of phenol by biochar was more than 80% in the 10 ppm solution after 20 hours, and greater than 100% after 20 hours in the 200 ppm solution and after 15 hours in the 500 ppm solution. Another finding was that the uptake was greater than 60% at 0 hours, when instantaneous samples were taken and analyzed. The results are promising and encourage further experimentation with other organic compounds that are commonly found dissolved in water and optimization of biochar accordingly.

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STUDY ON LAC PRODUCTION BY *KERRIA LACCA* ON PIGEON PEA UNDER VARYING CULTIVATION CONDITIONS IN DISTRICT JABALPUR, MADHYA PRADESH

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ABSTRACT

Pigeon pea (*Cajanuscajan* (l.) *mill* sp.) is an important crop amongst pulses and ranked second after chickpea in India, in terms of area and production. It provides protein rich food, firewood and income for resource poor small farmers. India is the largest production of lac in the worId. Three commercially potential products obtained from lac are resin, dye and wax, which find application in diverse areas such as food, pharmaceuticals, cosmetics, paints and varnishes. Lac insect life cycle and other productivity linked parameters very under different climatic conditions. Pigeon pea production practices involve an area of 5.32 mha. This area was also known for lac cultivation in previous decades. Rangeeni strain of *Kerrialacca* (*Kerr*) can be inoculated on pigeon pea during the month of Oct.-Nov. and harvested in June-July months along with production of pulses in the month of Feb.-March. This practice can enhance the income of farmers and also fulfill the demand of lac. Since, this practice is not done in forests, it is convenient to monitor and maintain host plants by farmers in their own lands. It is also develops host plants in very short period for inculation of lac insects. Pigeon pea improves soil nitrogen availability and can be grown on farmer's farm in irrigated conditions. Although, this is a hypothetical concept, pulse species like pigeon pea can be a good host plants for a lac production in agriculture areas of M.P. Research needs to be taken in agro-climatic zone suitable for production of pigeon pea to standardize the cultivation practices to enhance income generation and livelihood security in potential agriculture pockets of pulses in Madhya Pradesh.

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ENVIRONMENTAL CONSERVATION: ROLE OF MEDIA, NON GOVERNMENT ORGANIZATIONS, JUDICIARY AND EDUCATION

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ABSTRACT

The world in 21st century is facing many severe problems related to environment like climate change, energy crisis, depletion of natural resources, pollution of air, water and soil etc. on one hand world is developing at a very fast rate due to which dependency on the natural resources is also increasing day by day resulting in depletion of natural resources. The ever increasing population and changing lifestyle of human are increasing the severity of the problems associated with environment. After evaluating and assessing the mistake of human many exceptional steps have been taken to improve it and media is also playing a vital role in eradicating this problem and making it success. For example, the credit for the success of Government of India's programme 'swachchha bharat abhiyaan goes to the united efforts of the Government and media. In India, there is a growing young population that uses new media platforms like facebook, twitter etc and many applications like Swatchta Mahua with these social media platforms, the youths are well connected with each other as well as with local or global issues. Except media, there are several non government organizations whose concerns are fixed on various social issues, health issues and environmental issues. There are large number of non government organizations in the world that are working for environmental conservation, protection and awareness. This paper describes various laws related to environment and its role in conserving it. It also throws some light on judicial remedies available for environmental protection and some phenomenal principles and doctrines propounded by Indian judiciary. In addition to these, education can also help in environmental conservation as the first Earth day in 1970 was a student based effort. Universities can also help to establish the sustainable development through teaching programmes, research etc. The main objective behind this study is to identify the role of media, non government organizations, judiciary and education in environmental conservation, protection and awareness.

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EFFECT OF CYANOBACTERIA ON AQUATIC ECOSYSTEM

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ABSTRACT

Algae, a vital group of bacteria and plant in aquatic ecosystem due to their ability to produce oxygen Cyanobacteria is one of the most important component of aquatic ecosystem. They shows oxygen evolving photosynthesis which produces oxygen in the atmosphere therefore earth's Co_2 rich atmosphere gradually changed to include increasing amount of oxygen. Cyanobacteria play a vital role in all aquatic ecosystems which forms the food and energy basis for all organisms living in lakes, ponds and streams. It has ability to fix atmospheric nitrogen. It is very important for the growth of many types of plants. Excessive growth of Cyanobacteria form blooms. Toxin producing bloom in lakes can also reduce population of numerous species due to toxicity. Some impacts of blooms may disrupt lake food webs by killing fish, including possible effects of toxins on fish, invertebrates, and other aquatic fauna, or indirect, including: a reduction of submerged plants when plankton biomass becomes very high; and changes in fish community structure if summer cold water refuges are lost due to hypolimnetic anoxia.

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A MODEL BASED CASE STUDY OF IMPACT OF WEATHER ON DIFFERENT CULTIVARS OF BT-COTTON AND SOWING DATES

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ABSTRACT

To pave a way for the Silver Fibre Revolution one has to understand all the intricacies of its biotic and abiotic stress. This is also, to imply the best management practices necessary, well derived through experiments or modeling. Since the introduction of Bt-Cotton there occurred a revolution in the production of cotton crop in India. The study includes three Bt-Cotton varieties at three different sowing days to assess the suitable variety at suitable planting date. This is due to the going on debate, i.e. which variety and sowing date would give a better output. And, as many studies suggest that earlier sowing date could give a better yield. This has been done through modeling through DSSAT upon field experiment data. As per model output we observe that the Pancham-541 variety shows the best average yield over the years with the sowing date 10th May over years. Also the values of SD and CV suggest that the yield of this variety has been impacted with the changing years compared to the other variety and other sowing dates. Least production can be seen in the variety SP-7007 compare to other varieties. Also in SP-7007 with increasing sowing date the production has been decreasing, in contrary to the variety Pancham-541 which has increasing trend with increasing dates, as suggested by the model studies. Sowing date of 21st May has shown least variability in all three varieties over years. Where least CV of the variety SP- 7007 in all sowing dates as compare to other variety as per model output suggest least impact of changing weather conditions over year on this variety. Maximum average yield is seen in Panchan-541 as compared to other varieties.

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REINVENTING MARKETING TO MANAGE THE ENVIRONMENTAL CHALLENGES IN INDIAN SOCIETY

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ABSTRACT

Changing technological, legal, environmental, economic, and political conditions since 1991 have impacted Indian society. Privatization of public institutions, globalization, liberalization, reduced government support, and immediate livelihood needs have affected traditional agriculture practices and human-environment dynamics. This study examined marketer's perceptions of major challenges facing Indian society today. Indian people identified ongoing ecological processes as dominating daily life and actions. The paper also identifies the three particular segments of new marketing or green marketing and explores the challenges and solutions to businesses in Indian Society. The paper also examines the new trends of marketing in India and describes the reason why marketers should follow environmental guidelines for long term benefits. Results established that environmental conditions, particularly water resources, human resources, air pollution and wild life were main concerns. Transformation to a market economy coupled with limited state assistance over the last 30 years has decreased rural water supplies, reduced mobility, and increased overgrazing, leading to land degradation. Water availability, variable precipitation, insect invasion, adequate pasture, extremely hot summer and extreme winters as the primary challenges. Marketing activities in the past have based their strategies on the assumption of infinite resources and zero environmental impact. With the growing recognition of finite resources and high environmental costs, marketers need to reexamine their policies and practices. They need to revise their policies on product formation, pricing, placing, branding and distribution. The recent environmental challenges has added another layer of concern as consumers adjust their lifestyles to a lower level of income and spending. Companies must balance more carefully their growth goals with the need to pursue sustainability. Increased attention will be paid to employing green marketing and social marketing thinking to meet the new challenges.

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ANTIFUNGAL EFFECTS OF AERIAL PART(LEAF) OF *Barleria Prionitis* WITH ETHANOL EXTRACT ON PATHOGENIC STRAINS

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ABSTRACT

According to all India ethno-biological survey carried out by the Ministry of Environment & Forests, Government of India, there are over 8,000 species of plants being used by the Indian people. The present study was planned to investigate the antimicrobial effects of *Barleria prionitis* leaves. Therefore, the preliminary successive solvent extraction and chemical test revealed the presence of secondary metabolites in various extracts. Microbial inhibitory effects can provide us clue for further investigation. Ethanol extract was used for investigation of inhibition on five pathogenic fungal strains and done by broth dilution methods with triplicate. PD media used for fungal culture. Fluconazole used as positive control and DMSO was used as negative control. Statistical analysis has been done by Mean ± Standard Deviation with range, in which n=3. In the present study, we found that *Barleria prionitis* leaf ethanol extract gave very strong inhibitory effect against all tested pathogenic fungi, given the presence of flavonoids, alkaloids, saponins and tannins, which are responsible to show antimicrobial, relieve in toothache and whooping cough. *Barleria* leaves have high level of activity against tested pathogenic strains.

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IMPACT OF CLEAN DEVELOPMENT MECHANISM (CDM) PROJECTS ON SUSTAINABLE DEVELOPMENT: A CASE STUDY OF CHAMBA DISTRICT (HIMACHAL PRADESH)

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ABSTRACT

The clean development mechanism (CDM) is part of global carbon market developing rapidly as a part of Kyoto response towards mitigation to global warming. One of the aims of CDM is to achieve sustainable development in developing countries, but uncertainty prevails as to whether CDM is doing what it promises to do. In Himachal Pradesh Chamba District have more than 20 hydropower projects out of which 12 are CDM projects. These CDM projects have dual objective of providing green energy and sustainable development of the local area. These CDM projects have both positive as well as negative impacts. Positive impacts are reduced use of thermal power, low carbon emission etc. Some of the negative impacts of hydroelectric projects include loss of vegetations, topographical disturbances, changes in rivers flow patterns, involuntary resettlement, health problems, loss of cultural values and marginalization of local people. Hydropower development adversely affects the productivity of agriculture. This study examines the impacts of these projects in rural areas and considers implications for sustainable livelihoods. The study is based on the random sampling of 200 respondents at various locations. A semi-structured questionnaire was prepared and interviews from different sections of the community were taken. It was found that many short term benefits have accrued to the rural community from these CDM projects but at the same time changes in land use have adverse impacts on agriculture. It is argued that there is a need to support new types of land based economic activities on abandoned agricultural lands, reclaim degraded lands, and introduce new products and production methods, and suggest the local people better investment options for their sustainable future livelihood.

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INFLUENCE OF CULTURE ON THE ENVIRONMENTAL AWARENESS OF PRIMARY TEACHERS

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ABSTRACT

Environment refers to the surrounding of an organism which includes both living and non-living components. According to NCF 2005, Environmental education is a process that aims at development of environmentally literate citizens who have knowledge and skills and can compete in a global economy. Environmental awareness in this study is defined as teachers understanding about a number of environmental or ecological concepts, environmental issues and it is represented by the scores obtained on environmental awareness test(EWAT) used here. Environment and society are closely related and they are interdependent. All human rely on environment and natural resources to fulfil needs and sustain health. India is full of culture and these cultures have value system and ethics which even helps the conservation of environment. But people have the greatest impact on the environment in the ways that they exploit natural resources and dispose of waste. Religious practices have caused water pollution in lots of places. Present study is focussing on though primary teachers have high degree of environmental awareness as calculated but culture has shown a vivid influence on environmental degradation. A semi structured interview schedule was used to observe the influence of culture on environment. Sample size taken in this study is 50 primary teaches of Delhi and random sampling method was used to collect data. More than half of the respondents were bound to follow the rituals prevailing in the society but few of them about 30% gave some alternatives for the conservation of environment.

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CLIMATE CHANGE AND THE EXISTENTIAL QUESTION FOR THE DALIT AND ADIVASIS WOMEN IN INDIA

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ABSTRACT

Climate change affects all human beings, across the globe, irrespective of their caste, class, gender, religion, race, ethnicity and nationality but some communities are more vulnerable due to their disadvantageous socio-cultural position in the society. And similarly, in India Dalit and Adivasis women are the direct victim of the negative harsh impacts of the climate change. The proposed paper is a humble attempt to explore how does climate change harm the basic socio-economic human rights of the Dalit and Adivasis women in India. It will explore into the dimensions of the basic socio-economic human right like, right to health, right to fodder and fuel, right to food, right to shelter, and right to drinking water being violated by the climate change. To enquire into how climate change is a threat to the minimum decent survival of the Dalit and Adivasis women, I will be arguing from the viewpoints of the feminist environmentalism. Admitting the fact that the role of Panchayati Raj Extension to Scheduled Areas (PESA) and Joint Forest Management Committee (JFMC) is very crucial, I will also be engaging with some of the policy initiatives done by the government of India in this regard.

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SANITATION AND HYGIENIC CONDITION OF URBAN SLUMS – A CASE STUDY OF KANPUR CITY

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ABSTRACT

The number of slums has significantly increased in Kanpur city over the last three decades. Rapid urbanization, caused largely by heavy influx of migrants from rural areas, has exerted severe pressure on urban housing and public service in the city of Kanpur with which the expansion of infrastructure and basic urban services could not cope. This situation coupled with the destitute economic condition of poor migrants has given rise to the formation of a large number of slums where service inadequacies have been compounded and multiplied on a massive scale, resulting in hazardous environmental conditions against this background the study was performed. Data has been collected from field survey, besides some secondary sources have been also focused. Some experts and several officials like slum development authority, Municipal Corporation and other officials. The study reveals that status and practice regarding water, sanitation and hygiene conditions of slum dwellers in Kanpur city. This paper has also explored that assessment of water resource availability and quality at source point of consumption, problems faced in getting safe drinking water, and knowledge of the features of hygienic latrine; awareness about health. In addition to the above, the survey also gives emphasis on the awareness regarding the hygienic condition of these slum dwellers.

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SUSTAINABLE DEVELOPMENT: INTEGRATING HUMAN RIGHTS AND DEVELOPMENT

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ABSTRACT

Industrial revolution has triggered the growth in setting up of the new industries for providing technologically advanced products thereby pushing up Gross Domestic Products, the National Income, employment and bringing a dent in foreign exchange. But in this process of so called development what was forgotten by the nations was preserving the pristine purity of the environment and natural resources along with protection of inherent human rights. It took many years, lives of thousands of people, sustained pain and injury, for the nations across the globe to realize that human health and environment could not be compromised to live in the so called developed world. History presents illustrations of fight for economic development in isolation of the inherent human rights. The episode of Bhopal gas tragedy, Vedanta and Posco reflect the lack of inclusive development coupled with integration of human rights. Although there has been a constant dialogue at International forums referring to adoption of inclusive and sustainable development which integrates human rights in different treaties, discussions, agreements like United Nations Conference on Human Environment 1972, Rio Declaration 1992, Kyoto protocol (climate change treaty), etc. but the concept of development has witnessed an unbalanced approach skewed towards development at the cost of environment and human rights. The Indian judiciary has been attempting to address the issue by recognizing the concept of sustainable development in harmony with human rights but in vain. Environmental jurisprudence like Environmental impact assessment, environment education, tribunals, etc. are instrumental in addressing this issue but the profit motive of the firms have not been able completely balance development with human rights. Enlightened conscience, PIL, RTI, might not present a solution to this mismatch but reflect an initiation in the right direction.

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NATURE, RELIGION AND ECONOMICS

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ABSTRACT

The discovery of agriculture resulted in the surplus production. It's the key factor which gives rise to the modern human society. It enabled humans to abandon evolution, that is the adaptation with the environment and opt for civilization that is tweaking of the same. Surplus had its other outcomes like war, state, trade and the religion. Institution of religion has three fundamental aspects that is the demand, the demand fulfillment and thanksgiving. With the thanks giving part, human associates with the nature. The interpretation of the human-nature relationship depends upon the stage of the civilization a society is going through. Nature has its own religion. A religion to take care of all that exists in it. According to the observation of Charles Darwin "It is not the strongest of the species that survives, or the most intelligent that survives. It is the one that is most adaptable to change." In other words, the survival of any species depends on how much it is adaptive to its given environment. In this natural world human were the first and only species which rebelled against the concept of adaptation. From the primitive societies based on symbiotic relationship with the nature to the earliest agrarian civilizations up to the modern industrial societies which is based on dialectical interrelation, the history of civilization and the economic history is essentially the history of changing way of analyzing and interpretation of the human-nature relationship. This paper is an attempt to stitch the thread between nature, religion and economics.

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REVIVAL OF THE TRADITIONAL *HIMROO* TEXTILE CRAFT OF AURANGABAD – A CASE STUDY

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ABSTRACT

India is famous for the art of cloth weaving since olden times. It produced not only the essential cloth for daily wear but the fancy cloth depicting the skill of the craftsmen. Colorful fabrics of cotton and silk were woven in India for generations by skilled workers who were trained in their early childhood at the pit looms. One of such traditional weaving crafts belonging to the state of Aurangabad is known as *Himroo*. *Himroo* fabric is made of silk and cotton which are locally grown in Aurangabad and nearby areas of Maharashtra. The main feature of these fabrics is that the finished product resembles satin. In addition the unique colors and bold patterns of the fabric give them a distinct appearance. This makes them a perfect choice for sarees, shawls and stoles. However, present marketing practices are causing a decay of these traditional clothing materials. The handloom industry has declined over the years and *Himroo* is being duplicated on power looms. *Himroo* products can be modernized but evolution from tradition to modernity is possible only when the principles of continuity and change are adopted properly. Total quality management is a new approach to develop and intensify quality at each and every stage of production. In this proposal it is attempted to identify the major issues plaguing this traditional industry, provide sustainable yet modern approaches for the revival of these traditional textiles.

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BIOSORPTION OF PRECIOUS METALS FROM E-WASTE: PROSPECTS AND CHALLENGES

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ABSTRACT

Electronic waste or E-waste is a generic term used for waste left after end of life (EOL) of electronic goods. According to E-waste (Management and Handling) Rules, India (2011), E-waste is defined as means waste electrical and electronic equipment, whole or in part or rejects from their manufacturing and repair process, which are intended to be discarded.

It has been reported in literature that about 500 million PCs reached the end of their service lives between 1994 and 2003, which consists of approximately 2,872,000 t of plastics, 718,000 t of lead, 1363 t of cadmium and 287 t of mercury. This generation of huge amount of e-waste is dangerous for the whole eco-system. Researchers all over the world are trying to treat E-waste using different technologies. While bioleaching is associated with slow rate of reaction, there are various environmental concerns related to chemical treatment processes. A new term 'Green Adsorption' has been introduced recently in literature which includes the low-cost materials originated from agricultural sources, agricultural by-products, agricultural residues and wastes. Biosorption is an emerging physicochemical adsorption process which employs certain types of inactive, dead, microbial biomass to bind and concentrate heavy metals from even very dilute aqueous solutions in the similar manner as ion exchanger of biological origin. Thus, biosorbents can also be considered a category of Green Adsorbents. Searching for good green adsorbents among various agricultural wastes and by-products is a tedious task for researchers and therefore numerous research efforts have been made in order to find out new low-cost adsorbents with good adsorption capacities. Present paper is an effort towards assessment of potential and prospects of this technology for removal of precious metals from E-waste. The paper focuses on new and innovative technologies that can be employed for treat E-waste and provide Eco-friendly solution for this kind of hazardous waste. Efforts are made to list all factors that affect the efficiency of metal removal process. Attempts have been made to investigate the prospects of this technology for large scale E-waste treatment.

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AIR POLLUTION: AN OVERVIEW

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ABSTRACT

Pollution today poses a major threat to the survival of the world we live in. Pollution has crossed alarming situations in Indian cities. Cities registered with very high level of PM 2.5 pollutants were Delhi, Kanpur, Patna, Gaya, Agra, Srinagar, Jaipur, etc. According to World Health Organizations global air pollution database a survey was conducted and fourteen of the world's cities with levels of PM 2.5 are in India. Several reasons for air pollution include burning of fossil fuels, emission of pollutants from vehicles due to incomplete combustion of petrol and diesel, emissions from factories, garbage burning and mining operations. According to Central Pollution Control Board PM 2.5 are responsible for causing the greatest harm to human health. Inhaling the poisonous air is as hazardous as smoking as it can lead to cancer and many respiratory problems. According to Forbes India led the world in total number of deaths attributed to air pollution in 2016 with 1.61 million.

In India till last year air pollution was not a national problem and hence no steps were taken to curb it. Whatever steps were taken to control air pollution was limited to the boundary of Delhi and ironically Delhi tops the list of most pollute city in the country.

During 1990s Delhi ranked 4 among 41 most polluted cities of the world. It became so serious that a Public Interest Litigation (PIL) was filed in the Supreme Court. The government was asked to take appropriate measures including switching over the entire fleet of public transport, i.e , buses from diesel to Compressed Natural Gas (CNG). All buses were converted to run on CNG by the end of 2002 CNG became so popular because it burns most efficiently, unlike petrol or diesel. Steps have to be taken to curb the unseen threat of air pollution which is feeding on the growing population and leading to incurable problems. Certain steps include quality check of air in more and more cities of India so that this information will be made public to aware them about the alarming situation. Certain laws that were made by the government of India in 1980s include Environment (Protection) Act and Air (Prevention and Control of Pollution) Act should be amended according to present situation and should be enforced with greater strictness. On individual level one should contribute towards the betterment of the country by following the present government's motto "SWACHH BHARAT SWASTHA BHARAT" and should play an important role in reducing air pollution by shifting to CNG fitted vehicles and using public transport for daily commute. All of us are familiar with the problem so let us focus on the steps to reduce air pollution to make our country clean and healthy.

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EVALUATING THE EFFICIENCY OF *Aspergillus niger* AND ITS MUTANT FOR THE BIOREMEDIATION OF DISTILLERY WASTE

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ABSTRACT

Distilleries are one of the major waste polluting industries with about 88% of the raw material ending up as waste and it is one of the main environmental problems and 80% of water pollution. The demand for alcohol in India is growing day by day. The wastewater or spillage products from such distilleries contain huge quantity of dissolved organic matter, heavy metals, dyes having high BOD, COD, colour, organics coupled with low pH and when discharged in a river or ground results in impairment of ecological balance. These discharge into water bodies, sombre the aquatic life in consonance with of water and. The discharge of such effluent to water bodies cause ecological imbalance by inhibiting the growth of desirable aquatic biota due to its microtoxic and metal chelating properties, and it also decrease in the quality of irrigation land.This poses a serious pollution threat; thus it is mandatory for distilleries to respond appropriately and obligatory to develop the appropriate technology for treatment. Aerobic and anaerobic treatment of waste water leads to reduction in COD and BOD value but colour persists and even gets darker. In this regards, *Bioremediation plays a vital role*. Therefore, the present investigation is based on bioremediation of distillery waste with *Aspergillusniger* and its mutants has been planned to improve the quality of effluent, so that it may achieve permissible standards for safe disposal. From this study, it was observed that, reduction in COD is best achieved by mutant 2 in comparison to control and mutant 1and it is also reflected in the pH that's why lowest pH is also recorded in the same. However, colour removal is not significant in case of mutant 2, it is better in case of mutant 1. After anaerobic and aerobic treatment, reduction in COD and colour is better achieved in case of mutant1. Although in all cases, best efficiency is obtained on sixth day, after that it has declined and overall mutant 1 (COD reduction up to 79%) is better in comparisons to control and mutant 2. Hence this approach could be used to develop cost effective, eco-friendly biotechnology package for bioremediation of distillery waste before its disposal.

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Pongamia pinnata: SOURCE OF GREEN ENERGY FOR ENVIRONMENTAL SUSTAINABILITY

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ABSTRACT

The hasty consumption of fossil fuel has seriously alerted environmental impact resulting worldwide alertness towards global warming and climatic changes, associated with static increase in CO_2 emission in the atmosphere, and influencing humankind world over. The concern for biofuels as an alternative fossil fuel is essentially motivated by seriousness over rising crude oil prices, global warming, draining of fossil fuels and increasing demands. Biofuel acquired from plant species has duly been considered as crucial renewable source of energy. Sustainable and extensive research is being carried out on biodiesel yielding species like Pongamia pinnata and *Jatropha curcas*. Development initiatives are sustainable only if long term economic stability is ensured through benefit sharing and support to rural livelihood. Such an approach has to be incorporated in biodiesel plantation programme in order to ensure long term solutions to ever increasing energy demands. *Pongamia pinnata* (Linn.) Pierre is deliberated as future sustainable biofuel, owing to its plentiful production of biodiesel rich seeds, tolerance to abiotic stress, potential therapeutic component and ability to fix biological nitrogen. It is native of temperate and tropical Asia including India, Australia, and China and has expanded beyond its native distribution due to tolerance to frost, heat, water logging and drought corroborated to robust root system. Additionally seeds of the tree contain high oil content ranging from 30 to 55 per cent and yields about 30 $kgtree^{-1}$ $year^{-1}$ of seeds. Pongamia being a potential biofuel crop needs to be planted widely and seed to be harnessed and processed to meet sustained demands for clean fuel as biofuel.

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AIR POLLUTION AWARENESS AMONG SCHOOL AND COLLEGE STUDENTS – A CASE STUDY OF DELHI AND NCR

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ABSTRACT

WHO's latest list of polluted cities places 13 Indian cities among the world's top polluted cities. Cities from Indo-Gangetic plains Varanasi, Kanpur, Allahabad, Lucknow, Agra and others find mention in the list on account of rapid growth and increasing levels of Particulate matter. Delhi and NCR have been in the limelight for severe levels of air pollution. Delhi has been consistently ranked among world's most polluted cities in terms of air. Such severe were the levels of pollution during both November 2016-2017 that schools had to be closed and the particulate matter concentrations were beyond levels that could be estimated by monitors at the US Embassy. While most of the research in Delhi and NCR has focused on the physical and chemical characterization of the problem, relatively no attention has been given to the socio-cultural aspects that underlie it. Public consultation particularly among school students and college youth can be also useful to empower people in requesting the compliance to air quality standards. Since children are the future of our country if they are aware and made adequately sensitized air quality would be expected to be better in the future. It is therefore, of importance to undertake awareness campaigns among students through experiential learning workshops which make them learn by experience and also motivates them to take up initiatives for air quality management.

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IMPACT OF BIOMASS FUEL USAGE ON WOMEN HEALTH IN RURAL AREAS

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ABSTRACT

Biomass Fuel refers to burned plant or animal material; wood, charcoal, dung and crop residues which account for more than half of domestic energy in most developing countries and for as much as 95% in low income countries. An estimated 2.5 to 3 billion people worldwide rely on biomass fuels to meet their household energy needs. Burning wood, animal dung, or crop wastes in simple stoves, these households typically generate high levels of indoor air pollution that adversely affect health, especially of women. Using household data from rural areas it is estimates that the effect of biomass fuel use on women health is very high. It is estimated that about 3 billion people in the world rely on biomass fuel for cooking, heating and lighting. The biomass fuel chain incorporates gathering, transportation, preparing and ignition. These procedures are overwhelmingly overseen by women where they function as gatherers, processors, bearers or transporters and furthermore as end-clients or cooks. Accordingly, they endure wellbeing dangers at all phases of the biomass fuel chain. The primary target was to evaluate wellbeing impacts identified with the utilization of Biomass fuel and indoor air contamination in provincial territories. Essential females of the family were the objective gathering as they dealt with the biomass chain. A quantitative unmistakable cross-sectional examination configuration was received to survey the wellbeing impacts related to the utilization of biomass fuel and indoor air contamination. The study showed that women suffer different type of health effects due to the biomass fuel chain. Physical exhaustion, neck aches, headaches, knee aches and back aches were reported as the principal health effects associated with the burning of biomass fuel. Irritation of the mucus membrane of the eyes, nose and throat coughing, shortness of breath and exacerbation of asthma were identified as principal health effects associated with the biomass fuel (cooking). As a result of the detrimental impact of indoor air pollution on health and mortality, many governments, non-governmental organization and international organizations should develop strategies aimed at reducing indoor air pollution. The strategies to include subsidization of cleaner fuel technologies, development, promotion and subsidization of improved cooking stoves, use of solar thermal cookers and solar hot water heaters, processing biomass fuel to make them cleaner, modifying user behaviour and improved household design.

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PRESENT ENVIRONMENTAL CRISIS AND THE ECO-FRIENDLY PRACTICES OF JARWA TRIBE

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ABSTRACT

Today humanity is facing one of the most challenging crisis of its entire history and that is environmental pollution and degradation. It is a crisis that even has threatened the existence of our nature and mother earth. The most horrible consequence of environmental pollution is global warming and climate change. The main reason behind this catastrophe is our greed and highly consumerist way of life. Solution lies in cultural change and in this regard, we can learn so many lessons from the tribal world whom we normally call uncivilized, backward and primitive. But on the contrary the way of life of most of the tribes is much more scientific and environment friendly than us. One of such tribes is Jarwa tribe who are the aboriginal tribal group of Andaman and Nicobar Islands and absolutely eco-friendly in their practices. Jarwa is a Negrito tribal group who are the natives of North, Middle and South Andaman. Their numbers are just 450 and they are still hunter and gatherers living in the dense tropical forest in a symbiotic relationship with nature. There practices are related to hunting, gathering of food and honey, seasonal pattern of construction of settlement and their medicinal practices are completely eco-friendly and show their closeness, love and care for the nature e.g. for the collection of honey, they do not use fire or cause any harm to the bees rather they have identified an oil extracted from a herb, which has properties that prevents biting by the bees, which they smear on their body and very delicately extract the honey from the bee-hive without harming the Bees. Similarly, they have many more practices which are scientific and eco-friendly. Thus, the practices and way of life of the Jarwas show us the path to lead a life which is in perfect harmony with nature. Normally we think about their mainstreaming and making them civilized but in many ways, their way of life is more scientific and sustainable. Now the time has come we should learn lessons from these tribes to change our eco-unfriendly life style based on the consumerism.

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PLANT GROWTH PROMOTING (PGP) TRAITS IN *Enterobacter Cloacae* ISOLATED FROM DIESEL CONTAMINATED SOIL

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ABSTRACT

In the present study, *Enterobacter cloacae* (KP226567) (PR2) isolated from diesel contaminated soil was screened for plant growth promoting (PGP) traits. The organism produced ammonia (NH3), Indole acetic acid (IAA), ACC Deaminase, Catalase and showed phosphorus solubilization activity. Additionally, the organism was tolerant to high levels of multiple heavy metals such as Mo, Zn, Mn, Pb, Ag, Al, Cr, Cu, As and Ni. When rice var. Sahbhagi was inoculated, it induced seed germination and showed enhanced elongation of root and shoot length. *Enterobacter cloacae* (KP226567) may be employed in sustainable production of rice var. Sahbhagi under environmental stress.

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MONITORING URBAN EXPANSION IN ALLAHABAD CITY USING LANDSAT SATELLITE IMAGES

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ABSTRACT

The conversion of rural landscape into urban areas through development is currently occurring at an unprecedented rate. As our cities continue to grow, it is required that the adverse impacts of anthropogenic modification of environment in and around our urban centers be curtailed rather than to consider those adverse impacts as inherent, inevitable and hence accepted price of urbanization. Sustainable urban design and planning requires identification of land cover change at the fringe areas as well as within the city. To identify urban expansion and associated change in land cover LANDSAT imageries of the study area for November 1990 and December 2009 have been used. Supervised fuzzy technique of land cover classification was used to generate membership value of different land covers within each pixel for the two images. The membership image of settlements from the two images was compared so that addition of built up surface within the city in form of urban infilling and transformation of urban fringe areas to urban landscape was identified. Allahabad is one of the oldest urban centre in middle Ganga plains of northern India that lies on flat alluvial plain. Since 1950 the city had experienced enormous growth in population size and areal extent and at present stretches well beyond the rivers (Ganga and Yamuna) that once formed its natural boundary. Since last two decades, the city has witnessed a trend for infilling of open land within the city due to which the city presents an ideal opportunity to study the impact of urban infilling and expansion.

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ECOLOGICAL CHARACTERIZATION OF HABITATS OF ANOPHELINE LARVAE IN BAGHPAT DISTRICT OF UTTAR PRADESH

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ABSTRACT

Malaria is a major public health problem causing significant morbidity and mortality in India. Itis a climate sensitive and the pathogens complete their development in particular species of the insect that transmits parasites. Malaria is vector borne diseases (VBD) transmitted by the bite of infected female *Anopheles* mosquito from humans to humans. *Anopheles* mosquitoes are the most important group of insect, female mosquitoes requires a blood meal for eggs production. Ecology, distribution and breeding habitat of vectors are associated with disease transmission. About 1,112 cases have been detected from district Baghpat in the last five years. To determine the ecological characterization of breeding habitats and abundance of malaria vectors in Baghpat district. Four study sites were selected based on the epidemiological data. A total of 12,220 anopheline larvae were collected from aquatic habitats. Collected larvae were quickly transported and reared up to adult stage in insectary at optimum conditions. About 9,473 larvae emerged into adults and identified using identification keys. Breeding habitats such as ditches, agriculture channel and cemented channels have several ecological characters viz; house dwelling surrounding of habitats, presence of vegetation, stagnation of clear water and water movement. Pool (3.61), Pit (1.5), Ditches (4.07 Larval Density per dip), cemented (1.76) and agriculture channels (1.61) were identified as the preferred breeding habitats. The abundance and diversity of anopheline species was highest at Katha study site with *An. culicifacies* (45.72 %) and *An. stephensi* (9.42 %) while in Baragaon *An. culicifacies* (42.84%) and *An. stephensi* (6.04 %) and at Baghpat site, *An. culicifacies* (38.82%) and *An. stephensi* (11.80%) and at Khekra *An. culicifacies* (27.45 %) and *An. stephensi* (12.08 %) were identified. *An. culicifacies* and *An. stephensi* were identified in our study sites predominantly and further studies are required to get a clear picture of the major malaria causing species for adequate control of mosquito breeding in the district Baghpat.

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WATER QUALITY INDEX ANALYSIS USING GEO-SPATIAL TECHNIQUES FOR SELECTED LOCATIONS IN DELHI CITY

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ABSTRACT

Importance of quality of water is well understood and it becomes even more important when it is used for drinking purposes. Water samples from 21 houses in different locations of Delhi were collected and analysed for various physico-chemical parameters like pH, EC, TDS, Total Hardness, Total Alkalinity, Chloride, Fluoride and Nitrate. The water quality data from these selected locations have been analysed using Geographical Information System (GIS) Technique. For this, interpolation was done through inverse distance weighted (IDW) method in ArcGIS software for various parameters mentionedabove to draw the general scenario of available water quality (WQ) in different parts of the city, which were represented by thematic maps. Further, Water Quality Index has been calculated using Weighted Arithmetic Index (WAI) method, thereafter thematic layer, reclassification and weight value assigned in weighted overlay tools in Arc GIS software, were used to generate Drinking Water Quality Index (DWQI) map. DWQI was described in five categories as excellent, good, satisfactory, poor and unfit for drinking. Out of all the selected locations, DWQI was found to be good only at two locations, whereas at the remaining locations, the DWQI was found to be satisfactory. However, the water quality was found to be suitable for human consumption. In this paper, the Geo-Spatial technique is applied to analyse data and results obtained are presented in the form of maps that are used for better understanding of present water quality scenario of the study area. The spatial database established can be a reliable technique for monitoring and managing water quality in the water supply system.

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INTEGRATED CROP AND DISEASE MANAGEMENT PRACTICES IN MINIMIZING SPOT BLOTCH MEDIATED YIELD LOSSES TO WHEAT CROP IN EASTERN INDO-GANGETIC PLAINS

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ABSTRACT

Spot blotch disease, caused by *Bipolarissorokiniana* (Sacc.) Shoem. is one of the most serious biotic constraints affecting wheat (*Triticum aestivum* L.) production in the eastern Indo-Gangetic plains. Field experiments for two years were conducted during 2012-13 and 2013-14 under natural hot-spot conditions of spot blotch at Pusa, Samastipur, Bihar (India) to work out an integrated disease management system. Also, the effect of balanced fertilization (N, P, K, Zn, S and B), fungicidal seed treatment and foliar sprays of fungicides either individually or in combination were assessed for reducing spot blotch severity and associated increase in grain yield and other yield attributing characters. Multiple spot blotch scores were recorded to calculate the area under the disease progress curve (AUDPC). Average maximum temperature (27.00C) and high relative humidity (>90%) in February and March during both years favoured disease development and spread. Disease symptoms started early at the seedling stage and were highly influenced by nutrient stress, suggesting that crop management factors are integral component of spot blotch management strategies for wheat. Seed treatment with carboxin + thiram recorded higher seed germination and early plant establishment along with lower seedling blight incidence, thus useful for integrating with other management options. The two foliar sprays of fungicides significantly reduced the AUDPC, seed infection and increased grain yield and other yield attributing characters. *In vitro* analysis of untreated pre-sown seeds through blotter paper test revealed 19.2% and 32.5% presence of *B. sorokiniana* during 2012-13 and 2013-14, respectively. At the end of the cropping season, seed infection in harvested seed lots was recorded to the tune of 5-6% in integrated treatments, 13% in two sprays of propiconazole and 71% in control plot. Application of balanced nutrition alone reduced AUDPC by 37% and increased grain yield up to 26%. However, the combined influence of balanced nutrition and carboxin + thiram seed treatment as well as two foliar sprays of propiconazole resulted 99% reduction in AUDPC values with 60% higher grain yield (6.30 t ha-1), 45% higher TKW (41.33 g) and significant increase in other yield attributes. The finding of this investigation elucidate the role of crop management practices (balanced soil nutrition, seed treatment and foliar spray of fungicides) in decreasing the spot blotch severity and increasing the agronomic performance of wheat under hot and humid environment of eastern Gangetic plains of India.

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CONSTRUCTED WETLANDS - A SUSTAINABLE SOLUTION FOR LANDFILL LEACHATE TREATMENT

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ABSTRACT

The concentrated leachate from landfill sites is a major threat to aquatic ecosystems and public health. This paper presents an overview of the use of constructed wetlands for remediation of landfill leachate. The constructed wetlands are relatively novel technology with great potential for environmental remediation. The constructed wetlands have been extensively studied for treatment of diverse type of wastewater. They have been found highly effective for the remediation of bio-refractory organic compounds, plant nutrients, as well as hazardous heavy metals. The treatment process mechanism, parameters, plant species, and performance for removal of pollutants from landfill leachate are to be evaluated. The constructed wetlands may provide sustainable solution for treatment and management of landfill leachate.

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COLLECTION OF GHGS FROM LANDFILLS- A SUSTAINABLE SOLUTION

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ABSTRACT

Green House Gases (GHGs) are gases that both absorb and emit thermal radiation or heat in the infra-red range 700 nm to 1mm and contributing to the climate change. The composition of GHGs has four major components methane (CH^4), carbon-dioxide (CO^2), nitrous-oxide (N_2O) and water vapour (H_2O). Landfill is an important anthropogenic source for generation of CH4 in urbanizing and developing country like India. The generation of Municipal Solid Waste (MSW) is directly linked with the socio-economic status of the public and its management is one of the challenging task in India. The dumping of MSW in landfill sites is the cheapest and easy method for MSW management in India but it has negative impact on the environment which includes emission of GHGs and generation of leachates. The anaerobic decomposition of MSW from landfill sites in general contributes 60% CH_4 and 40% CO_2.The emission of GHGs from the MSW waste depends on composition of waste, availability of readily bio-degradable organic matter, the age of waste, moisture content, pH and temperature. The process involved for emission of GHGs in the atmosphere is totally based on bacterial decomposition, volatilization and chemical reaction. The various technologies viz. phyto-capping, phyto-stabilization, anaerobic digestion, pre-treatment of solid waste and waste co-digestions are the sustainable solutions to recover the GHGs from the MSW landfill sites. The collection of GHGs from landfill is necessary to avoid natural fire hazards.

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ASSESSMENT OF BIOLOGICAL TREATMENT FOR REMOVAL OF AMMONIA FROM SURFACE WATER

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ABSTRACT

Every year print media report the incapability of the water treatment plants of Delhi in treating surface water due to a high level of ammonia coming from Haryana. Presence of ammonia causes high chlorine demand during treatment affecting the disinfection efficiency and leads to the production of tri-halo-methanes and organo-chlorines which are suspected to be carcinogenic. Partial nitrification of ammonia in distribution pipelines can lead to the formation of nitrite which can cause serious health hazard such as methemoglobinemia (Blue Baby Syndrome). There is a need for a separate ammonia removal treatment scheme which can be modified in conventional treatment plants of Delhi. This study presents biological treatment of ammonia in surface water using the principle of nitrification. The lab setup consists of two 3 litres glass reactors in series filled with gravel as growth media for bacteria. The setup was fed with water containing ammonia concentration (5-7 mg/l). Orthophosphate was fed to the system as it is one of the primary nutrients of nitrifying bacteria. Initially, 0.4 mg/l of orthophosphate was maintained in the system which was then increased to 0.6 mg/l to study its effect on ammonia oxidation. The rate of nitrification under different ammonia concentration was studied by analyzing ammonia, nitrite and nitrate concentration with respect to time. In the early stage of the experiment the rate of nitrification was slow; however, after the complete acclimation of the bacterial population up to 7 mg/l of ammonia was oxidized within a day.

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वैदिक युग में पर्यावरण संरक्षण

डॉ. सुनीता शर्मा
संस्कृत विभाग
डॉ. भीमराव अम्बेडकर कॉलेज (दिल्ली विश्वविद्यालय)

पर्यावरण की समस्या ने समस्त संसार को संत्रस्त किया हुआ है इसके कारण केवल मानव ही नहीं जीव जंतु भी पीड़ित है और प्राकृतिक संपदा भी निरंतर प्रभावित हो कर विनाश की ओर अग्रसर है | वायु प्रदूषण, जल प्रदूषण, ध्वनि प्रदूषण, भूमि प्रदूषण के कारण हर साल असंख्य प्राणी काल का ग्रास बन रहे है | इस समस्या से मुक्ति पाने के लिए हर साल लाखों करोड़ों नहीं बल्कि अरबों रूपये व्यय किये जा रहे है तो भी उक्त समस्या से मुक्ति पाने की आशा दिखायी नहीं देती |

परन्तु प्राचीन भारत में यह समस्या कही नहीं थी| जड़ चेतन जगत सुरक्षित था | हमारे दूरदृष्टा ऋषि और चिन्तक विद्वान पर्यावरण के प्रति पूर्णतः जागरूक थे | वैदिक युग में एक ही पूजा–पद्धति सर्वत्र प्रचलित थी और वह थी "यज्ञ" | राजा हो या रंक, गृहस्थ हो या वानप्रस्थी सभी यज्ञ के द्वारा पर्यावरण को शुद्ध रखते थे क्योंकि यज्ञ से निकलने वाले धुएं में इतनी क्षमता और गुण मौजूद होते है | जो वातावरण को शुद्ध बनाने में सहायक होते है |

वैदिक काल का मानव प्रकृति के प्रति संवेदनशील तो था ही, साथ ही उसका सौन्दर्य बोध भी विकसित था उसे धरती का सौन्दर्य इतना प्रिय था की वह उसे अनन्तकाल तक देखते रहने की कामना करता था | भारतीय ऋषियों, मुनियों ने सभी प्राकृतिक शक्तियों को पूजनीय माना है | ऊर्जा के अपरिमित स्रोत सूर्य को देवता के रूप में मान्यता दी है | वैदिक काल अरण्य संस्कृति का स्वर्ण काल था | उन दिनों वन देवी आरण्यानी की आराधना की जाती थी और यह वन देवी प्रकृति माता का ही पर्याय थी | यह जीवों–वनस्पतियों के जीवन पोषण, संरक्षण व विकास का आधार थी | जंगल को देवता तुल्य माना जाता था | भारतीय आर्य परंपरा में अरण्य, तयोवन और कुंज–ज्ञान स्थली, कर्मस्थली और तपस्थली रहे है इस दृष्टी से भी वैदिक काल में पर्यावरण संरक्षण का विशेष महत्त्व था | वृक्षों की पूजा उन दिनों गौरव की बात थी | स्कन्दपुराण और कठोपनिषद के अनुसार पीपल के पेड़ की जड़ों में ब्रह्मा, तने में विष्णु और टहनियों में शिव का वास माना गया है | वहाँ कहा गया है:–

मूले ब्रह्मा त्वचा विष्णु साखायाम् महेश्वरम् |
पत्रम सर्व देवानाम् वृक्ष देव नमोस्तुते ||

वैदिक काल से आज तक भारतीय संस्कृति के विभिन्न आयामों का यदि अवलोकन करें, तो उसकी अहिंसावादी विशिष्ट विशेषता सदैव दृष्टीगोचर होती है | वैदिक काल के ग्रंथों में **मा हिंस्यात सर्वभूतानि |** यह उपदेश था | वैदिक आर्यों ने सदैव ही प्रकृति की पूजा की और द्रविड़ों ने भी प्रकृति के सभी उपादानो को इसी समभाव में देखा है | वे पत्र, पुष्प, फल, चन्दन को पवित्र मानते थे द्रविड़ों की भी यही मान्यता रही है की हवन से प्रदुषण समाप्त होता है | तथा पुण्य की चन्दन की सुगंध से वातावरण सुरभित होता है | भारतीय शास्त्रों में विशेषतः उपनिषदों में पृथ्वी को परमात्मा का शरीर, स्वर्ग को मस्तिष्क, सूर्य और चंद्रमा को आँखें तथा आकाश को मन माना गया है | इसलिए हमारी वैदिक प्रार्थना, शान्तिपाठ एवं स्वरित वाचन में औषधि, वनस्पति, जल,

वायु, पृथ्वी, आकाश सभी को शान्ति हेतु विनती की जाती है और यह शान्ति पर्यावरण शुद्धि से ही संभव है | इस शुद्धि हेतु हमारे पूर्वजों ने दैनिक यज्ञों की परंपरा डाली | शतपथ ब्रहामण में यज्ञ को प्रजा का पालक तथा रक्षक कहा गया है | वहाँ कहा गया है:– अग्नि से घूम, घूम से मेघ और मेघों से वृष्टि होती है | यज्ञ से विशुद्ध वर्षा जल, उत्तम स्वास्थ्य एवम् धन धान्य की प्राप्ति होती है | यज्ञ ही अन्न, पाश, संतान का उत्पत्ति कर्ता और उनकी सम्रद्धि का विधायक है कालिका पुराण में कहा गया है की देवताओं के निमित यज्ञ न होने से अन्न का क्षय होता है | बादल नष्ट हो जाते है | बादलों के नष्ट होने से वर्षा नहीं होती है | वर्षा के अभाव से मनुष्यों के लिए भोजन की कमी हो जाती है जिससे सारा संसार दुर्भिक्ष का शिकार हो जाता है |

वैदिक युग में यज्ञ न केवल पर्यावरण बल्कि खेती के लिए भी उपयोगी माना जाता था क्योंकि यज्ञ से वायुमण्डल में पौष्टिक तत्व बढ़ते है | जिससे जनन क्षमता वाले बीज पैदा होते है | जिनमें अंकुर जल्दी आते है | यज्ञ की सामग्रियों के पृथ्वी में मिलने से पानी सोखने की शक्ति बढती है | वैज्ञानिक तौर पर भी यह साबित हो चूका है की यज्ञ के धुएँ में B एसिटिक एसिड होती है जो पौधों के लिए लाभदायक है | उदाहरण के लिए जब पौलेंड में "जगल की मौत" नामक बिमारी से जंगल सूखने लगे | तब वहाँ पर उनके पास तीन मास तक अग्निहोत्र यज्ञ किया गया जिसके कारण 1984 से वहाँ हरियाली शुरू हुई तब से आज तक वहाँ चारो ओर हरियाली है | वैदिक आर्यो के अनुसार केवल यज्ञ ही एक ऐसा माध्यम है, जिसके द्वारा वे सभी छोटी बड़ी समस्यों का समाधान कर सकते थे | यज्ञ पर्यावरण को तो शुद्ध करता ही है | साथ–साथ विभिन्न प्रकार के रोगों में भी परम उपयोगी है | इसलिए वैदिक आर्य सदैव अपने घरों में यज्ञाग्नि को प्रज्जवलित रखते थे और रोगों से दूर रहते थे |

HOW SAFE IS POTABLE WATER IN SOME LOCALITIES OF DELHI?

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ABSTRACT

The definition of potable water says 'water of sufficiently high quality that can be consumed/used with low health risk impact'. Unfortunately, the term 'safe' drinking water horrifies that the water, which usually looks clean, may not be safe to consume. In a country like India, availability of safe and clean drinking water has become a trance. Surveillance of drinking water in Delhi has been meticulously carried out to acquaint the Water safety approaches, the effective management and operation of water sources, treatment plants, distribution networks etc. In this paper, an attempt was made to find out any divergence/resemblance between water qualities, and its physico-chemical and bacteriological parameters of four different localities in Delhi. Samples were collected from residential areas of Maharani Bagh, Khan Market, Naraina village and Naraina Industrial area. Various water quality parameters such as temperature, pH, electrical conductivity (EC), total dissolved solids (TDS), salinity and redox potential (Eh) were measured. The results of the physical parameters of Maharani Bagh & Khan Market revealed the following ranges: temperature: 25.2°C - 26.2oC, pH: 6.64-7.80, conductivity: 187-511 µS/cm, total dissolved solids: 90-260 mg/L, total hardness: 12-84 mg/L, turbidity: 0.27-3.5 NTU, whereas in case of Naraina area these were: temperature: 25.2° -26.2°C, pH: 7.80-8.1, conductivity:293-429 µS/cm, total dissolved solids: 145-195 mg/L, total hardness:, 188-200 mg/L, turbidity: 0.49-0.5 NTU. All these parameters are within the desirable limits of Drinking Water Quality Standards (IS 10500:2012). Interestingly, dominance of total coliforms were observed ranging from 132-12103 CFU/100mL and 86102 to 196105CFU/100mL. However, the situation was observed to serious in Naraina village and Industrial area where, fecal coliforms were detected in high quantity ranging from 360 to 1200 CFU/100mL. The finding indicates the inevitability for regular microbial evaluation with detailed identification followed by corrective actions. Further risk assessment should be carried out to meet the health-based targets and establish stringent rules and regulations for drinking water quality standards.

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PLANT BASED SEWAGE TREATMENT SYSTEM

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ABSTRACT

Sewage generation in India is about 38 million litres per day (MLD) and the treatment capacity is about 12 MLD. Total untreated sewage is almost 70% of total sewage generated and is generally discharged in nearby water sources. The sewage flowing through nullahs joins rivers/lakes and other water bodies in untreated conditions and creates heavy risk of sewage contamination. With degradation of water quality due to organic enrichment mainly on account of domestic sewage that enters a water body and sewage contaminated water may produce large scale outbreak of water borne diseases and cause epidemics. Thus a proper plan is required to treat these waters. There are various different technologies based sewage treatment plants available in the market. In the present study, a natural plant based sewage treatment system developed by CSIR-NEERI was studied for its capability to treat mix sewage. Plant based sewage treatment systems are based on natural treatment methods and have distinct advantages over conventional treatment plants. In this technology, treatment occurs via methods such as filtration, sedimentation, nutrient uptake by plants and microbial action in a constructed system which is filled with gravels. Specifically identified different species of plants (Typha, Cyperus Spp. and Canna Indica), which are known to have good nutrient uptake rates are planted in the gravel bed. The plant based sewage system was studied during the months of September to December 2017, wherein substantial removal efficiency (>65%) was observed for BOD, COD and Total Kjeldahl Nitrogen (TKN).

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PREVALENCE OF BACTERIAL POPULATIONS IN DRINKING WATER SUPPLY OF A RESEARCH BUILDING IN DELHI

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ABSTRACT

The aim of this study was to assess the bacterial population and identify the bacteria compositions inhabiting in the supply chains of different micro-environments of a research building using phenotypic and 16S rRNA sequence-based analysis. Water samples were sourced from six major zones inside the research building premises. Results found were breath taking and become a milestone for further investigation. In total, 14 different bacterial strains were isolated and characterized; out of which seven were identified using 16S rRNA sequence-based analysis. These group of bacteria belongs to -proteobacteria namely *Aeromonas dhakensis, Pseudomonas putida, Klebsilla pneumonia, E.Coli, Serritia fanticola, Lelliottia nimipressuralis*. The range of total coliforms was found several folds higher than the feacal coliforms, indicating the presence of other water borne pathogens. For many decades, the practice was to search for the only indicator organism whose absence signals the absence of other pathogens; however, this is not always the case. Because pathogens and indicator bacteria react differently to environmental stresses, pathogens can be present in drinking water even when no indicator bacteria have been detected. The consensus was that the abundance of tap water bacteria was greatly influenced by water purification and distribution. These bacteria are released from the biofilms formed in the distribution system and are especially considered as the major potential risk for drinking water bio-safety. Bacteria can exploit very dilute solutions of organic matter, and can form microbial aggregates in the water system that are capable of sheltering bacteria from contact with chlorine disinfectants, including systems with a controlled constant residual chlorine level.

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WATER POLLUTION, CRISIS AND CONFLICT IN INDIA

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ABSTRACT

Water pollution is a major environmental issue in India. The largest source of water pollution in India is untreated sewage other sources of pollution include agricultural runoff and unregulated small scale industry. Most rivers, lakes and surface water in India are polluted This blog focuses on the issue of water pollution in India as it is a serious problem plaguing a great majority of its people, and its severity and scope are great causes for concern. 80% of sewage in India flows untreated into the country's rivers. Sewage is just one aspect of the water crisis, as numerous industrial, domestic, and natural sources of pollution release pollutants and contaminants into India's water bodies. The impact of these substances on the environment, more specifically water resources, in India is far-reaching, and the health and quality of human lives are also threatened. Water pollution contributes to a lack of safe drinking water in many parts of India, and an estimated 1,000 Indian children die of diarrhoeal sickness every day. Water conflict is a term describing a conflict between countries, states, or groups over access to water resources. The United Nations recognizes that water disputes result from opposing interests of water users, public or private. A wide range of water conflicts appear throughout history, though rarely are traditional wars waged over water alone. Instead, water has historically been a source of tension and a factor in conflicts that start for other reasons. These conflicts occur over both freshwater and saltwater, and both between and within nations. However, conflicts occur mostly over freshwater; because freshwater resources are necessary, yet scarce, they are the center of water disputes arising out of need for potable water, irrigation and energy generation.

RIVER GANGA AND ITS SOCIAL, CULTURAL AND ECOLOGICAL PERSPECTIVE FOR SOCIAL DEVELOPMENT IN INDIA AND THE WORLD

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ABSTRACT

Rivers are like arteries and veins of the earth. River Ganga has its own special significance. The water of GANGA is to be known as elixir and nectar. Oldest civilization was established and it flourished on the bank of River Ganga. Vedas, Shrimad Bhagvatgita and other Purans and other holy scriptures praise the importance of Ganga. It is the backbone of our Economy. Holy River Ganga is the foundation of our civilization, culture and Political Economy. Five states 85 districts and two countries are directly affected by its water. The significant contribution of Ganga to the social development of the country is par excellence. Pollutants of this holy river can be divided into five categories. This is very serious indication by looking the River today that the Holy River is dying day by day. We are extracting the water resources mercilessly and making it poisonous by pollutants. We could not save The Ganga River even by spending 20,000 Crores since 1985 till date. We have to study social, cultural and ecological perspective of River Ganga and its contribution to the social development of the country and the world. This is multi dimensional, multi faceted and multi pronged. We have to save Mother Earth by 'Save Ganga Campaign' it is the cry of the day.

SOLID WASTE MANAGEMENT

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ABSTRACT

Solid waste management is a term that is used to refer to the process of collecting and treating solid wastes. It also offers solutions for recycling items that do not belong to garbage or trash. As long as people have been living in settlements and residential areas, garbage or solid waste has been an issue. Waste management is all about how solid waste can be changed and used as a valuable resource. Solid waste management should be embraced by each and every household including the business owners across the world. Industrialization has brought various good things and bad things as well. One of the negative effects of industrialization is the creation of solid waste. Waste can take any form that is solid, liquid, or gas and each have different methods of disposal and management. Waste management normally deals with all types of waste whether it was created in forms that are industrial, biological, household, and special cases where it may pose a threat to human health. It is produced due to human activity such as when factories extract and process raw materials .Waste management is intended to reduce adverse effects of waste on health, the environment or aesthetics. A large portion of waste management practices deal with municipal solid waste (MSW) which is the bulk of the waste that is created by household, industrial, and commercial activity.

SOLID WASTE MANAGEMENT IN INDIA: CHALLENGES & OPPORTUNITIES

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ABSTRACT

Solid waste refers to materials which are unwanted and which has been generated in a particular area by combined activates by an individual and a group of individuals or by an industry. With the advent of 21st century Urban India is facing an ever increasing challenge of providing a good quality of human life by fulfilling the infrastructural needs to its freeman. According to the Census of 2011, the population of India was around 1.21 billion; of which 31% live in cities. It is further estimated that by 2050 more than half of India's population will live in cities. With this rapid growth of population in cities, management of Municipal Solid Waste (MSW) in the country has emerged as a severe problem not only because of the environmental and aesthetic concerns but also because of the large quantities generated every single day. According to Central Pollution Control Board 1, 27,486 TPD (Tons per day) of Municipal Solid Waste was produced in India during 2011-12, with an average waste generation of 0.11 kg/capita/day. Out of the total waste generated, approximately 89,334 TPD (70%) of MSW was collected and only 15,881 TPD (12.45%) was processed or treated. Municipal authorities of India are bound to provide various essential services for its freeman, out of all such services, Solid Waste Management (SWM) is one among the basic essential service, to keep urban centres clean. However, almost all municipal authorities deposit solid waste at a dumpyard within or outside the city haphazardly. Segregation at source, collection, transportation, treatment and scientific disposal of solid waste was largely insufficient which leads to degradation of the environment and poor quality of life mainly in urban and semi-urban parts of India. On the basis of above background, this paper will be divided into four sections along with subsections; the first section will analyze solid waste management and its present status in India. The second section of the paper will concentrate on major hindrances in solid waste management in India, third part of the paper discuss the initiative taken by government and NGOs to tackle the issue. Forth section will analyze the success and failure of such initiatives. Last portion of the paper will focus on conclusions and recommendations.

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PRESENT AND FUTURE CHALLENGES AND RESEARCH DIRECTIONS OF MADHOGARH WATERSHED MANAGEMENT

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ABSTRACT

Presence of water distinguishes our planet from the others we know about. While the global supply of available freshwater is more than adequate to meet all current and foreseeable water demands, its spatial and temporal distributions are not. There are many regions where our freshwater resources are inadequate to meet domestic, economic development and environmental needs. In Mahograh watershed of Alwar, Rajasthan, the lack of adequate clean water to meet human drinking water and domestic needs is indeed a constraint on human health and productivity and hence on socio-economic development as well as on the maintenance of a clean environment and healthy ecosystems. All of us involved in research must find ways to remove these constraints. We face multiple challenges in doing that, especially given a changing and uncertain future climate, and a rapidly growing population that is driving increased social-economic development. How best to meet these challenges require research in all aspects of water management. Many governmental policies played an important role in reporting and disseminating current research related to managing the quantity and quality and cost of this resource. This paper identifies the issues facing water scarcity managers today and future research needed to better inform those who strive to create a more sustainable and desirable future.

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INDOOR POTTED PLANTS: AIR POLLUTION MANAGEMENT SYSTEM

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ABSTRACT

Air Pollution is considered as one of the life threatening challenges in Delhi/NCR. It is not only outside environment but also indoor environment that has a severe threat. Indoor air pollution is the degradation of indoor air quality by harmful chemicals and other materials; it can be up to 10 times worse than the outdoor air pollution. This is because contained areas enable potential pollutants to build up more than open spaces. Evidence also exists of associations with low birth weight, increased infant and prenatal mortality, pulmonary tuberculosis, cancer, cataract, and many more. The studies reveals that exposure to indoor air pollution may be responsible for nearly 2 million excess deaths in developing countries and for some 4% of the global burden of disease. The air cleaners could be one of the solutions to these problems but the cost, availability, use, comfort etc. make it more difficult. Moreover, some filters have been shown to improve symptoms of asthma. Further, the filtration systems and air purifiers do not reduce levels of all indoor air pollutants significantly; rather some types can actually aggravate the problem. A long-term and environment-friendly option is to bring home tubs of plants, specifically those that are known to purify air more than others. 'Indoor' potted-plants can remove air-borne contaminants such as volatile organic compounds (VOCs), over 300 of which have been identified in indoor air. This paper provides an evidence based insight into how anti-pollution plants can help in building and maintaining cleaner environment.

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JUGAAD INNOVATION: A TOOL FOR THE UPCOMING GLOBAL COMPETITION

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ABSTRACT

In today's world instead of doing just an Innovation modifying the strategy and heading towards JUGAAD INNOVATION to help bring the change. Its aim is to satisfy need of every sector by taking global scenario with respect to environment and sustainable development. Having a strong hypothetical sense helps to deliver a better solution and unique ideation lubricates the process. Working over projects and projects to fulfill the demand of hypothetical idea tends to the transition of many ideas and help build a sort of bridge between problems and solutions easily. Crowd sourcing Carbon Foot-Prints and their Reduction this revolves around knowledge of Automobile Pollution, switching the fuel as normal sea-water, by taking the ignition from the previously made electrolyte cells and trying to fulfill the pullovers in it to get an effective design of the model. Cell consists of and alloy terminal and activated carbon terminal, which reacts with sea water (which is absorbed in a thin separator between electrodes) to give out voltage and help car to run. Having a new design of exhaust funnel and changing the full fuel management for better results and help solve the problem. Further a Jugaad microscope has been designed for observation of blood sample that can show the dot sized platelets in a manner of projection using laser diode (mainly to diagnose diseases) and sourced a cheapest centrifuge to separate the components of the blood easily. A device has been manufactured that works on the principle of bone conduction in the human skull. By taking the instance of currently used audifono created a wearable for the jaw to help deaf ones hear and even mainly it can be used by normal people also in place of earphones and headphones, to coordinate between the outside sound and the one of the media coming from the device connected with the wearable.

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COMMUNITY DYNAMICS OF DEGRADED HIMALAYAN HABITATS

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ABSTRACT

Ecological disturbance, an external force; causes an allogenic change in the forest community. Landslides are one of the physical causes of such natural disturbances affecting myriad of ecosystems ranging from tropical, temperate to alpine. Several geomorphologic and seismic factors contribute a prolific ground for landslides to occur at Himalayan mountain regions. Nanda Devi National Park and Valley of Flowers National Park; Designated as world heritage sites, have been subjected to the catastrophic event of landslides in the Western Himalayas of state Uttarakhand. The present study aimed to quantify the post-landslide changes in forest composition, structure and physico-chemical properties of soil. Temporal pattern of disturbance was constructed from four landslide damaged sites, representing a chronosequence of 3, 5, 15 and 25 years of age and were compared with their nearby undisturbed forest, dominated by *Abies pindrow* and co-dominated by *Betula utilis*. Species richness increased significantly with the age of the site ($P<0.05$). At a successional level, dominant herbaceous species show a trend from annual, annual along with perennials and perennials. After colonization, the nutrient analysis of soil from young to old landslide in soil texture from sandy-loamy, soil pH decreased marginally from 5.1 – 4.0, while TOC (total organic carbon) increased with the stabilization of forest patch (2.0% - 50%) giving a significant difference with a ($P<0.05$). Data on NO3- N (μg/g) was not significantly different and neither followed the same increasing trend. Surprisingly, a difficulty was observed in the distribution of invasive species at degraded sites as a very few number (11) out of 110 climax species were found to be alien. Among the invasive species at the disturbed sites, *Rumex nepalensis* was the dominant pioneer herb among all the sites investigated and could be said to act like ruderal.

ILL EFFECTS OF PLASTICS

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ABSTRACT

Plastics are integral part of our daily lives but unfortunately, they are not safe to human health as well as to the environment. Though plastics are light weight, cost effective and now-a-days biocompatible and require little energy for their production but the chemical compounds within plastics cause adverse effect on human health and the environment. Collectively these harmful chemicals are known to cause severe health hazards like neurological damages, cancer, endometriosis, endocrinal or hormonal disruption, birth defects and child developmental disorders, reproductive damage, immune damage, multiple organ damage and various respiratory disorders. The present paper gives an overview of accumulation of plastic wastes in the natural environment, effect of plastic debris on the environment and wildlife, various harmful effects on humans, waste disposal and management solutions and required policy measures. These problems can be controlled and minimized by material reduction design for end-of-life recyclability, increased recycling capacity, development of bio-based feed stocks, application of green chemistry, strategies to reduce littering and reverse risk assessment approaches with the combined efforts of industries, scientists, policy makers, and of course public.

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IMPACT OF AGRICULTURE ON ENVIRONMENT

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ABSTRACT

The environmental impact of agriculture is the effect that different farming practices have on the ecosystems around them, and how those effects can be traced back to those practices. The environmental impact of agriculture varies based on the wide variety of agricultural practices employed around the world. Ultimately, the environmental impact depends on the production practices of the system used by farmers. The connection between emissions into the environment and the farming system is indirect, as it also depends on other climate variables such as rainfall and temperature. The degradation of land in one form or the other is matter of serious concern endangering sustainability of agriculture. Landslides caused by rains and flowing water in hilly areas and deforestation, overgrazing and faulty cultural practices in the forest and other plain areas expose the soil to water and wind erosions. As may be seen out of total geographical area, 141.3 million hectare (10.3 per cent) area is subject to such water and wind erosions. The waterlogging due to rising water table, particularly along the rivers, rendering soil unfit for cultivation, covers 8.5 million hectare land. Similarly, increased dependence on intensive agriculture and irrigation also resulted in salination, alkalination and water logging in the some irrigated areas of the country. In modern agriculture, the application the soil of organic amendments is somewhat troublesome. Undoubtedly the use of chemical fertilizer is in general more convenient for a farmer, due to the easier handling, storage, and other characteristics of feasibility.

FROM THE SUN GOD TO AN ENERGY RESOURCE: THE WAY AHEAD FOR A "NEW INDIA"

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ABSTRACT

The Sun is the basis of all life forms on earth. It exerts its impact on the earth in spite of a distance of over 149 million kilometers from the earth. It has enjoyed a revered position in the life of people of various ancient civilizations. Today, unbridled development has brought about changes in the climate and depletion of fossil fuel reserves. This paper looks at the developments in the solar energy sector and the initiatives that can be taken to develop this energy source in the future. According to the BP Statistical Review of Worlds Energy 2016, assuming today's level of extraction and the reserve estimates, coal will be depleted in 113 years, natural gas in 250 years, and oil in 50 years. On the other hand, energy and electricity requirements are only expected to increase. The UN has declared the decade 2014-24 as the decade of "Sustainable Energy for All". Amongst the non-renewable energy alternatives, solar energy is emerging as the most promising especially for countries in tropical regions. According to estimates by UNDP, the annual potential of solar energy far exceeds the worldwide consumption of energy. Europe plans to completely remove dependence on fossil fuels by 2050. India too has embarked on an ambitious plan to step up the solar energy sector and has taken a lead by establishing a worldwide International Solar Alliance consisting of 121 countries. Apart from this, various incentives have also been launched by the government to popularize solar energy usage in the country. According to the BP Review, Denmark is leading the world in contribution of solar energy to total energy at 59 percent. However, China is emerging as the leader as far as rapid growth in renewables is concerned, with US, Japan, India and Brazil also on a high growth path, a major part of which is solar energy. However, solar energy is still in a nascent stage contributing only 1.3 percent of global power generation. But, the share has doubled in just three years. For the future, various policy initiatives and increased awareness are the keys to improving the share of solar energy for an unending source of energy that will provide a more sustainable path for economic development. The Sun will then truly embody its symbolism as the "Dispeller of Darkness" to light the earth once the fossil fuels are all exhausted.

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ROLE OF YOUTH IN COMBATING CLIMATE CHANGE

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ABSTRACT

Climate change is one of the most critical global challenges of our times. Recent events have emphatically demonstrated our growing vulnerability to climate change. Climate change impacts range from affecting agriculture, further endangering food security, to sea-level rise and the accelerated erosion of coastal zones increasing the intensity of natural disasters, species extinction, and spread of vector-borne diseases. This issue is of immense importance for every global citizen. Hence it requires an initiative against it globally. Youth play a crucial role in combating climate change. A questionnaire-based pilot survey was conducted in Pune city of Maharashtra state, Indian to assess awareness about climate change among the college going youth. Amongst 201 respondents 66.2% were males and 33.8% were females studying in various faculties or courses. About 98.5% respondents said global climate is changing, 95.5% of the respondents also commented that human activities contribute to climate change. The study also assessed awareness regarding major international organizations and panels working on global climate change and its effects. Only 45.3% of the respondents knew about the United Nations Framework Convention on Climate Change (UNFCC) and the Kyoto Protocol while 45.8% were aware of the Inter-governmental Panel on Climate Change (IPCC) which conducts scientific analysis of climate change, global warming and its impacts. About 54.5% of the respondents believed that youth could play a major role in combating climate change.

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वर्तमान शिक्षा के परिप्रेक्ष्य में अध्यापक शिक्षा में 'नवाचार'

हरीश कुमार
मार्डन इंण्डियन कॉलेज, रेवाड़ी, हरियाणा

परिवर्तन सत्य, शाश्वत एवं सनातन है, प्रकृति में परिवर्तन की प्रक्रिया निरन्तर क्रियाशील रहती है, जडता प्रकृति के विपरीत है और गत्यात्मकता अनुकूल, पृथ्वी, चन्द्रमा, तारे सब कुछ परिवर्तन की ही परिणाम है, समाज इसी परिवर्तनशील जगत् का एक अंग है इसलिए समाज भी एक गत्यात्मक संस्था है और उसमें परिवर्तन उसकी गत्यात्मकता का ही परिणाम है आदिम युग या आखेट युग से विकसित होता हुआ मानव समाज आज औद्योगिक एवं वैज्ञानिक के विकास ने परिवर्तन की प्रक्रिया को और भी गति प्रदान की है, वैज्ञानिक युग तक आ पहुँचा है, विज्ञान एवं तकनीकि के विकास ने परिवर्तन की प्रक्रिया को ओर भी गति प्रदान की है, वैज्ञानिक यंत्रों एव ं उपकरणो ं ने वर्तमान समाज का ेसूचना एवं संचार क्रान्ति के युग में ला दिया है, तेजी से परिवर्तित हो रहे मानव समाज के प्रत्येक पक्ष यथा राजनीतिक, आर्थिक सांस्कृतिक, शैक्षिक एवं सामाजिक क्षेत्र मे परिवर्तन दृष्टिगोचर है। तीव्र जनसंख्या वृद्वि, नगरीकरण, औद्योगिकरण, पर्यावरण प्रदूशण एवं बेरोजगारी जैसी समस्यांए उत्पन्न हुई, जिनके समाधान हेतु शिक्षा प्रणाली समर्थ नही हो पा रही है, इसके लिए भी शिक्षा में नएपन अर्थात् नवाचार को लागू करना आवश्यक है, भारतीय सामाजिक व्यवस्था में भी परिवर्तन हुए है, साम्प्रदायिक सद्भावना बढाने की आवश्यकता अधिक तीव्र हुई है शिक्षा में 'नवाचार' का प्रयोग शिक्षा की रीढ का कार्य करता है जो इसे मजबूती प्रदान करने के साथ बदलते परिवेश में बालक का मार्गदर्शन कर उसके मस्तिश्क का विकास कर ज्ञान मे ं वृद्वि करता है 'नवाचार' को हमे ं शिक्षा में सकारात्मक रूप से स्वीकार करना चाहिए जिससे विकास के सोपानो ं में नवाचार सहयोगी या महत्वपर्ण भूमिका निभा सकें दूरसंचार तकनीक के युग में जहाँ हमने अपनी जीवनचर्या में आमूल परिवर्तन ला दिया है तो सीखने की प्रकिया मे ं भी 'नवाचार' का समावेश कर हम विकास को पंख लगा सकते हैं। 'नवाचार' सोच–समझकर किया जाने वाला नवीन और विशिश्ट परिवर्तन है, जिसे किसी प्रणाली के उद्देश्यों को प्राप्त करने के लिए अधिक प्रभावकारी समझा जाता है।

DOES ENVIRONMENTAL PROTECTION HURT ECONOMIC GROWTH?-EMPIRICAL EXAMINATION OF ENVIRONMENTAL KUZNETS CURVE HYPOTHESIS (EKCH)

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ABSTRACT

The causal relationship between economic growth, environmental consumption and degradation has been a subject of debate for last few decades. In this regard, the inverted U-shaped Environmental Kuznets curve (EKC) demonstrates (pollution-income relationship) that initially the environmental degradation and pollution surpass the level of income per capita; however this trend reverses since at the higher income levels economic growth initiates environmental improvement due to technological change that allows cleaner input to be used in the production of goods and services. This debate is reminiscent of the one that resulted from the Club of Rome Report (Meadows et al 1972).Unresponsive regarding environmental protection and endeavor to speed up economic growth had not only kept environmental considerations as secondary objectives in policy making in developing countries but also threatened their sustainable future. This paper empirically investigates the existence of Environmental Kuznets Curve Hypothesis (EKCH) in the context of India. It also tries to address the missing feedback link (possible effects of environmental degradation on economic growth) in the EKCH for carbon dioxide emissions. The missing feedback link has been addressed in a bivariate as well as tri-variate framework. The study also underlines other econometric and methodological problems with estimates of the EKC. Annual time series secondary data for all the variables has been taken from the World Bank Database of country level indicators. The implications for environmental policy with particular reference to a developing country like India are addressed. The time period of the study is from 1960-2011.

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WATER INFRASTRUCTURE IN DELHI: ISSUES AND CHALLENGES

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ABSTRACT

Delhi is urbanizing fast at an unsustainable pace way beyond its carrying capacity with respect to water supply, sewerage, drainage and solid waste disposal, open space, etc. Population of Delhi has increased from 1,744,072 in 1951 to 16,750,000 in 2011, i.e. approx. ten times. Though the annual growth rate of population has significantly fallen from 6.63% in 1951 to 2.10% in 2011, but still in absolute numbers, it is too high to ignore it in terms of maintaining a minimum standard of living, given the projected Delhi's population of 25.6 million in 2030. While water requirement has gone up multi-fold, diminishing water availability has resulted in a much reduced per capita water availability. The city presently gets water from the Ganga basin, Yamuna sub-basin, Indus basin and its internal aquifers. However, for the surface resources its right depends on several interstate agreements with other states namely Haryana, Punjab, Uttar Pradesh and Uttaranchal. In the present scenario these sources are increasingly being contested or depleted due to the incessantly growing demand. The situation has got further aggravated as a very high number of water bodies in Delhi have either dried up or been encroached upon. Due to the excessive groundwater extraction a number of areas in the capital have already been declared as 'over-exploited areas' or some even as 'notified areas'. As various reports suggest, there is a big gap between annual groundwater extraction in Delhi and the net natural recharge resulting in a fall of water table three feet every year. Delhi has recently been ranked the worst environmental performer in the country as, besides other parameters, it scored very low on the status of ground water and annual recharge. While over-exploitation is leading to a fall in water table, the pollution of surface and groundwater is becoming a matter of grave concern. The city lacks adequate capacity to treat the huge quantities of wastewater generated every day.True, the more water we use, the more sewage is produced. At present more than about 1349 of 2226 MLD of wastewater generated in the city is treated by sewage treatment plants and the rest of the waste water gets discharged into the drains without any treatment, thus resulting in the deterioration of the surface and groundwater quality. In the absence of a proper sewage and wastewater infrastructure, we are neither able to reuse the treated water, nor protect the sources of fresh water from getting polluted.The Yamuna is already declared a dead river by many due to lack of flow and high level of pollution. Thus, in order to sustain a decent level of living in the face of surging demand and dwindling supplies of fresh water, there is a serious need to assess and manage water supply, besides a due attention to sewerage, drainage and solid waste disposal.

In the present paper, an attempt will be made to (a) look into the sources of water supply in Delhi, (b) critically examine the governance of the municipal supply system along with the water infrastructure developed over the decades including the sewerage and sanitation, and (c) provide some viable suggestions at the end.

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WATER CONSUMPTION IN URBAN INDIA: A BEHAVIORAL APPROACH

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ABSTRACT

One of the most critical issues confronting the policymakers in India today is the availability of freshwater. Solution to the problem lies in water management and conservation. Water Conservation by way of reduction in water use in urban areas can be done by adopting pecuniary or non-pecuniary approaches. The pecuniary approaches involve certain financial or tariff related measures, e.g. appropriate pricing of water. However, water in many Indian cities is underpriced in relation to the cost incurred on its provision. One way of discouraging wasteful use of water is through the application of varied methods of pricing. For example in Delhi, water is free up to the use of 20 kilo liters per month, exceeding which the consumer will have to pay for the total quantity used at relatively higher rates. One of its advantages is that it subsidizes the water for the poor or the common people; but water demand tends to be relatively inelastic, i.e. changes in price may not have a big effect on consumption, especially for wealthy households. So it does not necessarily make the rich to reduce their consumption as they do not mind to pay more. Traditional economics would define this as an irrational behavior. For a commodity like water the consumers do not have a finite discount rate in their inter-temporal budget constraint and the individual might not even be considering future periods in his choice of water consumption today. So, the 'optimum' predicted by the traditional theory is actually not reached i.e. people consume more than they require even if it comes at a personal expense. Therefore, in situations where economic solutions are not generating desired results, we can add alternative methods to alter behavior to achieve the 'optimum'. These constitute the non-pecuniary/psychological/behavioral determinants of water usage that would help to target each household's consumption more precisely. In this paper an attempt will be made to identify some of these methods and their scope for urban households of India.

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SUSTAINABLE DEVELOPMENT IN INDIA: ENVIRONMENTAL ISSUES AND CHALLENGES

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ABSTRACT

In 1987, the **Brundtland Commission** published its report, "**Our Common Future**", in an effort to link the issues of economic development and environmental stability. In doing so, this report provided the off-cited definition of sustainable development asa "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*".During the mid-20th century the concept of sustainable forest management was relevant, later it was established that sustainable development will have three dimensions 1) Economic 2) Social 3) Environmental; because these three paradiagms are important for prosperity of humanity. With the rapid growth of Indian economy sustainable development has become very important in the era of 21st century. In India, the objective of sustainable development goals is to bring together development and environment into a single set of targets, which cannot be achieved without over exploitation of natural resources. In India, the natural ecosystem is under severe stress and its getting disturbed across most part of the country at a very alarming rate. Approximately 10 per cent of the country's wildlife is threatened with extinction; excessive use of fertilizer and pesticides is damaging the agricultural biodiversity of the country, a large fraction of water bodies are polluted and which lead to a situation of drinking water crisis, the huge amount of wastes are being produced at rates far exceeding our carrying capacity to recycle or manage. As environment is also a dimension of sustainable development, so we should keep in mind that the development is not hampering our environment. But from the last few decades the greed of human and rapid urbanization and industrialization has increased manifolds and which has led to a situation as mentioned above. This leads to a situation where we are forced to rethink about our environment. This paper aims to highlight the environmental issues and challenges faced by India in 21st century for attaining the sustainable development in a holistic approach. On the basis of above background, this paper will be divided into four sections along with subsections; the first section will give an overview of sustainable development and its present status in India. The second section of the paper will concentrate on major challenges that India is facing for attaining its goal of sustainable development. The third section of the paper focuses on the initiative taken by the governmental and non-governmental institutions to tackle the environmental issues and challenges for sustainable development in India. Forth section will analyze the success and failure of such initiatives. Last part of the paper will focus on conclusion and recommendations.

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LIFE STYLE CANCERS AND ENVIRONMENTAL RISK FACTORS: A SYSTEMATIC REVIEW OF GEOGRAPHICAL LOCATIONS IN INDIA

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ABSTRACT

Cancer as a lifestyle disease is becoming a major cause of morbidity and mortality in India despite the fact that this can largely be prevented by adapting healthier life styles. This systematic review examines the risk factors of lifestyle cancers in different locations of India as well as explores the existing preventive interventions. 2,301 articles were identified, out of which 17 were reviewed. Tobacco and alcohol consumption were identified as main risk factors in all locations but *bidi* smoking was strongly associated with lung cancer in South India (Chennai). The same lifestyle risk factors were associated with different cancers in different geographical locations. Unhealthy diet, tobacco and alcohol consumption were associated with colorectal cancer, Non-hodgkin lymphoma and oral cancer in West India (Mumbai, Pune). Tobacco and alcohol consumption were associated with gastric cancer in South India (Kerala). Consumption of tobacco, gutkha and other oral dip products were risk factors of oral cancer in South West India (Karnataka). Lifestyle factors (use of non-liquefied petroleum gas, early menarche, high parity), dietary factors, tobacco and alcohol consumption were associated with Gall bladder cancer and oesophageal cancer in North India (New Delhi, Jammu and Kashmir). Existing preventive interventions includes cervical cancer screening programmes, mouth self-examination programmes, rural population-based cancer registry, breast cancer awareness and tobacco-cessation counseling. Lifestyle patterns and urbanization in India has influenced dietary factors, physical activity and other lifestyle factors which has resulted in increased cancer cases in India. The awareness of these risk factors early detection of suspicious lesions and strengthening of preventive interventions would facilitate a decrease in cancer incidence in India.

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ENVIRONMENTAL DEGRADATION AND HEALTH RISKS FROM THE BHALASWA LANDFILL SITE IN DELHI

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ABSTRACT

Urban waste problems are not just confined to cities but also affect peripheral areas. Cities often depend on their peripheral sites for waste disposal due to lack of such space within cities attributed to the cost involved and congestion. These peripheral zones used for disposal are the potential sites of health risks and subsequent disasters. In Delhi sixteen dumping sites have been exhausted till now and the existing three open landfill sites are now on the verge of their exhaustion for the disposal of city's waste. The uncontrolled and unscientific disposal of wastes has created over stress on these landfill sites. These landfill sites have become the breeding ground for many communicable and other diseases and have adverse impacts on the environment and human health. This study explores the health risks of the community staying in and around the Bhalaswa Landfill site in Delhi based on the primary and the secondary data. This paper focuses on the waste situation in Delhi with respect to waste generation, collection and disposal of solid waste in Delhi. The study finds that the community is vulberable to health risks due to their low socio-economic condition, proximity to landfill site and the consequent ground water contamination in the study area.

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CLIMATE CHANGE: CHALLENGES IN AGRICULTURE

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ABSTRACT

Agriculture in developing countries must undergo a significant transformation in order to meet the related challenges of achieving food security and responding to climate change. Projections based on population growth and food consumption patterns indicate that agricultural production will need to increase by at least 70 percent to meet demands by 2050. Most estimates also indicate that climate changes are likely to reduce agricultural productivity, production stability and incomes in some areas that already have high levels of food insecurity. Developing climate-smart agriculture (CSA) in thus crucial achieving future food security and climate changes goals. Addressing climate changes impact on agriculture is special challenge.There are number of factors that influence the extent to which farmers in a particular location adopt CSA prioritization approach to provide information on climate change adaptation planning at local level.

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WASTE MANAGEMENT THROUGH COMPOSTING

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ABSTRACT

Waste management is all about how to dispose of all the things you do not want on the farm. Composting is a sustainable waste management practice that converts any volume of accumulated organic waste into a usable product. When organic wastes are broken down by microorganisms in a heat-generating environment, waste volume is reduced, many harmful organisms are destroyed, and a useful, potentially marketable, product is produced. Organic wastes may include manure from livestock operations, animal bedding, and yard wastes, such as leaves and grass clippings, and even kitchen scraps. A Carbon: Nitrogen (C: N) ratio of 30:1 is considered ideal for composting. Too much carbon or very large particle size slows the process down.

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PHOTOPERIODIC EFFECT ON GROWTH OF MALE JAPANESE QUAIL

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ABSTRACT

In the Avian literature, it was reported that photoperiod affects reproduction and in general, long days are stimulatory and short days are inhibitory in seasonal summer breeders. But age dependent effect of different photoperiods on the growth was not available in Japanese quail. To make the age dependent comparison of effect of different photoperiod on weight, 3 week old male Japanese quail were given exposure to light-dark cycle of 6L:18D, 7L:17D, 8L:16D, 9L:15D, 10L:14D, 11L:13D, 12L:12D, 16L:8D and 24L:0D (LL) upto the age of 15 weeks. Body weight of all birds of different groups was measured weekly upto the termination of study. Results indicate that body weight of quail exposed to 16 hour or 24 hour light in daily 24 hour cycle, was surprisingly higher as compare to 12-L group that was not different from short day groups (6-L to 11-L). This condition was maintained from the age of 7-11 weeks in 24-L group and from the age of 7-10 weeks in 16-L group. The rate of body weight increase in long day birds was slower around 6-7 week i.e. around reproductive age. On the other hand, body weight increase in other groups (6-12 L) was stopped and tend to be decreased around 6-9 weeks. This study concludes that i) increase in weight in early reproductive age (7-10 weeks in 16-L and 7-11 weeks in 24-L) is more effective in case of long day groups (16-L and 24-L groups) as compare to 12-L group that was not different from short day groups (6-L to 11-L); that ii) around early reproductive age (6-9 week) the body weight of 6-L to 12-L group tend to be decreased and then starts increasing thereafter upto 11 week age. Importance of study says that during early reproductive age (6-11 week), long day groups (16-L and 24-L) showed more or less increasing trend and surprisingly suppresses the normal reproductive age effect tending to lower the weight.

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STATUS OF GROUNDWATER IN GANGETIC PLAINS OF BHAGWANPUR INDUSTRIAL AREA HARIDWAR, UTTARAKHAND

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ABSTRACT

In the present study, data of 5 stations distributed at Bhagwanpur industrial area in the Haridwar district are analysed for the years 2014-15 for depth to water level and water quality. The average depth to water level during pre-monsoon is found 28.43 m and in post-monsoon there is a rise of 2.89 m in average water level and found average 25.54 m. Among all the 5 locations viz. Raipur Village, Bhagwanpur Town, Bhagwanpur bypass, Ambuja Cement and Punjabi Daba Bhagwanpur the distribution of water level shows that the water levels are deep in the entire Bhagwanpur block. For reviewing the groundwater quality, the water samples were collected from 41 sites covering the entire district. The groundwater is formed as Ca-Mg-HCO3 type. In the groundwater, alkaline earths exceed the alkalis and weak acids dominate strong acids. Although groundwater quality is good for drinking as well as irrigation purpose but in few samples higher concentrations of NO3-, Cl− and SO42− ions are found and hence continuous monitoring is required for these ions as precautionary measures. While almost all liquid fresh water of the planet occurs underground, its long term suitability as a source of water is threatened by point source of pollution from industries and by aquifer depletion due to excess ground water withdrawals. Hence, Industrial Waste water can be an important water resource but its use must be carefully planned and regulated to prevent adverse health effects and undue contamination of ground water. Local Ground water can be used for purposes with higher social or economic returns or saved for the future.

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ENVIRONMENTAL DEGRADATION AND ITS IMPACT ON HUMAN HEALTH

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ABSTRACT

Environmental Degradation is a phrase that refers to the effect on the climate of human actions, in particular the on fire of fossil fuels (coal, oil and gas) and large-scale deforestation , which cause emissions to the atmosphere of large amounts of 'greenhouse gases', of which the most important is carbon dioxide. Such gases take up infraredradiation emitted by the Earth's Surface and act as blankets over the surface keeping it warmer than it would otherwise be. Connected with this warming are changes of climate. When natural habitats are destroyed or natural resources are depleted the environment is degraded . Environmental degradation results from factors such as urbanisation, population growth, intensification of agriculture, rising energy use and transportation, climate change, pollutions arising from many sources such as technological activities. It is explored that as a result of the dynamic interplay of socio-economic factors and technological activities amongst many other factors, these have devastating consequences on human health. Thus environmental degradation consequences affect the health and the right to health of the people. Using the doctrinal method of research, we examine the confluence of environmental degradation and health from a rights perspective. An unhealthy environment possess health hazards consequently a violation of the right to health. Human beings are entitled to right to health even as the environment needs to be protected from activities which cause environmental degradation. This paper provides the insight view about the effects of environmental degradation and its impact on human health. Study finds that these kinds of Problems are not only seriously affecting the human by diseases and problems but also the animals and trees/ plants.

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DECENTRALIZED APPROACH FOR WASTE WATER TREATMENT AND LONG TERM EFFECT OF TREATED AND UNTREATED WASTE WATER IRRIGATION ON CROP AND SOIL QUALITY

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ABSTRACT

Due to rapid industrialization, more use of clean water leads to more generation of waste water and because of lack of adequate treatment of domestic sewage, the use of contaminated water is a common practice which sustains farmers' livelihoods in urban and peri-urban areas (Saravanan et al. 2004). Typically, such waters are polluted by excessive quantities of nutrients, plus they are contaminated with pathogens and toxic chemical substances that affect both the ecosystem and the public's health (Helmer et al. 1997).

In many areas, these discharges are used by local farmers for irrigating crops, thus introducing these pollutants to the crops mainly in periurban ecosystem, due to its easy availability, disposal problems and scarcity of fresh water (Khan et al. 2008a Sharma, Agarwal et al. 2008). Continuous irrigation of agricultural land with such wastewater may cause heavy metal accumulation in the soil and vegetables.

A field experiment was conducted from 2015 - 2017 to investigate the effects of drip irrigation with wastewater, and treated wastewater on crop quality at the 12-C Research farm of IARI, Delhi. A bioreactor was installed at 12-C field for the purpose of cleaning the waste water for the irrigation. After waste water irrigation, the level of metals in the wastewater irrigated field got increased with time in soil. While in treated water irrigated soil, concentration was very less. In case of crops, the level of heavy metals was found more in waste water irrigated crops then the treated water irrigated crops. From the study it can be concluded that wastewater cannot be used in agricultural land for long time, while treated wastewater can be used in sustainable agriculture in the long term. On the other hand, the health of consumers also not gets affected with the metal contamination by using the treated waste water for the irrigation.

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PLASTIC POLLUTION ABATEMENT: A REGULATORY APPROACH IN INDIA

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ABSTRACT

Plastic has become invincible part of our daily living. Population in India generates enormously, the indestructible plastic waste to an amount of approximately 56lac tones per year. Plastic has longer shelf life owing to its composition by complex polymers and hence takes many years to degrade. Presence of Plastic in all four basic categories of wastes (Municipal, Industrial, Bio-Medical & E-Waste) make the concern more serious. Government through Ministry of Environment Forest and Climate Change has seriously taken measures by notifying the Plastic Waste Management Rules in 2016 and ensures that these regulations are effectively implemented by concerned authorities for prevention and abatement of Pollution due to different types of Plastics that produced by manufacturers and reaches waste bin or landfill sites by end users. Present technical note brings forward a brief overview on the regulatory requirements as defined in Plastic Waste Management Rules, 2016.

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ENVIRONMENTAL CHALLENGES OF DELHI NCR AND POSITIVE ROLE MEDIA

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ABSTRACT

Delhi, the capital city of the country has grown many times since independence and would become the world's 2ndmost populous city (after Tokyo, Japan) by 2020. Delhi struggles with its rapid growth and is facing substantial pressure to improve commercial and residential infrastructure. Growing urbanization and migration of population in search for better employmentopportunities, good quality of lifestyle and better amenities, Delhi is constantly putting pressure on city's limited resources which often result in stressing the natural environment significantly. Among the environmental concerns such as air pollution, water pollution, waste generation and biodiversity are the major serious challenges that all fast growing cities and countries are facing and Delhi is no exception.

The study discusses the environmental issues and challenges fromthe media reports published in last six months on ambient air pollution, which is caused by human activities such as fuel consumption from motor vehicles, industrial facilities, municipal and agricultural waste sites and waste incineration/burning, heat and power generation.Second, on improper management of solid waste and inadequate treatment facilities resulting into serious environmental damage.Third, on water pollution, as the population is growing very fast; there is unavailability of limited water sources, leading to water crisis in some parts of Delhi. Fourth, onloss of biodiversity caused by alteration and loss of habitat, human activities and its negative impacts, climate change and overexploitation of natural resources.Last but not the least, the most important& valuable component of this paper isMedia, which playsa very big role in spreading awareness and capturing every single detail of environmentalissues and challenges,of which many of us are unaware and through thatthe concerned authorities/stakeholders can take clue to formulate appropriate action plans leading to improvement in the situation on short term as well as on long term basis for its people of the area of concern.

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ASSESSMENT OF LANDUSE LANDCOVER CHANGES AROUND MSW LANDFILL SITES IN DELHI USING REMOTE SENSING DATA ANALYSIS

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ABSTRACT

Municipal Solid Waste (MSW) management is one of the major challengesalmost in all the metropolitan cities of India. Delhi,the capital city of the country faces major environmental challenge associated with waste generation and insufficient waste collection, transport, treatment and disposal practices. The uncontrolled dumping of waste may cause environmental contamination in many ways leading to health hazards. Rapid urbanization and population growth has resulted in tremendous increase of municipal solid waste generation. The exponential growth of the population in Delhi over the years has happened due to lesser opportunities in rural areas and shift from stagnant and low paying agriculture sector to more paying urban occupations. Present solid waste management practices followed are finding it extremely difficult to manage the huge quantityas well as mixed variety of waste generated.

The main objective of this study was to assess the changes taken place in the landuse landcover around the two identifed MSW landfill sites (Gazipur and Bhalsava) within 5 km radius, over a period of about 28 years. Secondly, how much area of land would be required for MSW disposal at landfill sites in Delhi, if the current practices are continued. In this context, geospatial technologies and remote sensing methodology has beenused to analyse land use change detection at two landfill sites in Delhi. The results indicate that built-up area has increased considerably around the landfill sites between 1990 and 2018, and the MSW generation/dumping has also increased considerably at these sites. Further, approach for waste generation minimization and utilization of segregated waste has been emphasized.

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ISO 27001 Information Security Management Certification	Product Certification – CE Marking	Lead Auditor Training - ISO 50001:2015
ISO 20000 IT Service Management Certification	SMETA– SEDEX Ethical Trade Audit	Lead Auditor Training - 22000:2005
ISO 22301 Business Continuity Management Certification	C_TPAT Audit	Lead Auditor Training - 27001:2013
ISO 22000/ HACCP Food Safety Management Certification	Structural Safety Audits	Internal Auditor Training IATF 16949:2016, IMS, EHS

Certification Delivery Assurance:

COMPETENCE | CREDIBILITY | CONFIDENCE

Contact us:

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