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SAVE THE ENVIRONMENT (STE)

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STE Annual Awards 2019

(NOMINATION AND APPLICATIONS ARE INVITED)

LAST DATE 30th SEPTEMBER 2019

Annual Awards of STE are the tangible symbol to signify eminence of contributions made by a person or institution. This boosts the enthusiasm of the contributors that have contributed in different field of science and social service with their excellence, expertise and approach towards achieving certain goals for the society. Recognition of such extraordinary activities is eventually very important to boost their confidence and to honour them for what they have done for the science and society. STE confers following categories of awards and honours to such eminent personalities.:

1. STE Dr. APJ Abdul Kalam Award

The award is in the memory of our former president of India late Dr. APJ Abdul Kalam. This award is conferred every year to the senior scientist of DRDO/ISRO (working or retired) who has significantly contributed towards the science and technology in India. (**Eligibility:** Any Indian Citizen above the age of 55 years) Nominations will be from STE.)

2. STE Dr. Praloy O Basu Life Time Achievement Award

The award is constituted in the memory of late Dr. Praloy O Basu, Founder Secretary of STE. This award is conferred every year to any citizen of India, who has made the difference to the society by his/her contributions in terms of education/ policies/ S & T/Social Service and others. (**Eligibility:** Age above 45 years Nomination from STE)

3. STE Fellowship Awards

STE Fellowship award is conferred to the Indian senior scientists /Academicians for their outstanding achievements in various fields of science & Technology and Education. Total Number : 05 (**Eligibility:** Any one above the Age of 50 can apply)

4. STE Young Researcher Awards

The awards are conferred to the young Indian researchers to encourage and boost their enthusiasm. Total Number : 15 (**Eligibility:** Any one in the Age between 25 to 40 years can apply.)

5. STE Water Awards

The awards are conferred to the Indian nationals who have made the difference in the area of water by any means. Total Number : 10 (**Eligibility:** Any one can apply in this category and age is no bar)

6. STE Best Ideas / Innovations / Technology for Environment Awards

The awards are for the Indian Nationals to generate / develop the innovation towards serving the environment. Total Number : 5 (**Eligibility:** Any one can apply Age no bar)

7. STE Best Teacher Award

This award is given to the teachers of Indian nationality for promoting science and technology among the school students. Total Number : 5 (**Eligibility:** Teachers – teaching Science for Classes 9-12 can apply).

8. STE Women Awards

This award is constituted to recognize the Indian women scientists/ Academicians for their contributions in the field of science and environment. Total Number : 5 (**Eligibility:** Any woman above the age of 40 years can apply).

9. STE International Awards

This award is to recognize NRIs who have brought fame to the India by contributing towards Science & Technology / Environment / education/ Society. Total Number : 2 (**Eligibility:** Any one born in India but working abroad can apply. Age no bar).

For more information, please log on to our website
www.stenvironment.org/ste-awards/

SCIENCE FOR A BETTER TOMMORROW...

SCIENTIFIC INVENTIONS FOR THE ENVIRONMENT: *Plastic replacements*

Environment is an important element of nature and hence, science. Science involves new inventions and technological advancements. Nevertheless, most of these scientific technologies have led to environmental crisis throughout the globe. One of such invention is PLASTICS production. However, sustainable green innovations and technologies that could improve quality of life have become indispensable to protect the biosphere.

Plastic release into the rivers and oceans is a major concern and has perturbed the marine environment. The persistence of these non-biodegradable and unavoidable waste in the aquatic ecosystem has

also adversely affected the human life. The use of plastics has increased incredibly with global production exceeding 300 million tonnes per year since 2014. A recent article published in the journal, Nature reported that between 1.15 and 2.41 million tonnes of plastic currently flows from the global riverine system into the oceans every year (Fig. 1). The top 20 polluting rivers were mostly located in Asia (Table 1) and accounted for approximately 67% of the global annual input while covering 2.2% of the continental surface area and representing 21% of the global population (Source: *Lebreton, L.C., Van der Zwet, J., Damsteeg, J.W., Slat, B., Andrady, A. and Reisser, J., 2017. River plastic emissions to the world's oceans. Nature communications, 8, p.15611.*)

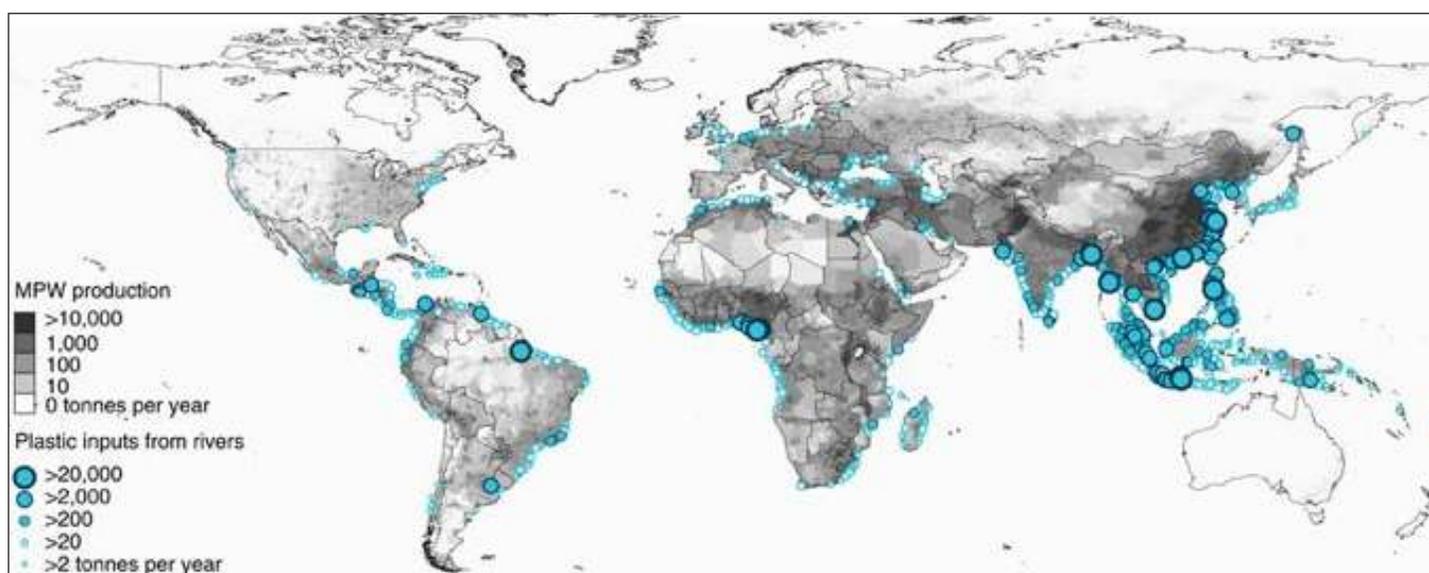


Figure 1: Mass of river plastic flowing into oceans in tonnes per year. River contributions are derived from individual watershed characteristics such as population density (in inhab km⁻²), mismanaged plastic waste (MPW) production per country (in kg inhab⁻¹d⁻¹) and monthly averaged runoff (in mm d⁻¹). The model is calibrated against river plastic concentration measurements from Europe, Asia, North and South America. (Source: *Lebreton et al., 2017*)

Table 1 | Top 20 polluting rivers as predicted by the global river plastic inputs model.

Catchment	Country	Lower mass input estimate (t yr ⁻¹)	Midpoint mass input estimate (t yr ⁻¹)	Upper mass input estimate (t yr ⁻¹)	Total catchment surface area (km ²) ²¹	Yearly average discharge (m ³ s ⁻¹) ²¹
Yangtze	China	3.10 × 10 ⁵	3.33 × 10 ⁵	4.80 × 10 ⁵	1.91 × 10 ⁶	1.58 × 10 ⁴
Ganges	India, Bangladesh	1.05 × 10 ⁵	1.15 × 10 ⁵	1.72 × 10 ⁵	1.57 × 10 ⁶	2.08 × 10 ⁴
Xi	China	6.46 × 10 ⁴	7.39 × 10 ⁴	1.14 × 10 ⁵	3.89 × 10 ⁵	5.53 × 10 ³
Huangpu	China	3.35 × 10 ⁴	4.08 × 10 ⁴	6.73 × 10 ⁴	2.62 × 10 ⁴	4.04 × 10 ²
Cross	Nigeria, Cameroon	3.38 × 10 ⁴	4.03 × 10 ⁴	6.5 × 10 ⁴	2.38 × 10 ³	2.40 × 10 ²
Brantas	Indonesia	3.23 × 10 ⁴	3.89 × 10 ⁴	6.37 × 10 ⁴	1.11 × 10 ⁴	8.18 × 10 ²
Amazon	Brazil, Peru, Columbia, Ecuador	3.22 × 10 ⁴	3.89 × 10 ⁴	6.38 × 10 ⁴	5.91 × 10 ⁶	1.40 × 10 ⁵
Pasig	Philippines	3.21 × 10 ⁴	3.88 × 10 ⁴	6.37 × 10 ⁴	4.07 × 10 ³	2.07 × 10 ²
Irrawaddy	Myanmar	2.97 × 10 ⁴	3.53 × 10 ⁴	5.69 × 10 ⁴	3.77 × 10 ⁵	5.49 × 10 ³
Solo	Indonesia	2.65 × 10 ⁴	3.25 × 10 ⁴	5.41 × 10 ⁴	1.58 × 10 ⁴	7.46 × 10 ²
Mekong	Thailand, Cambodia, Laos, China, Myanmar, Vietnam	1.88 × 10 ⁴	2.28 × 10 ⁴	3.76 × 10 ⁴	1.74 × 10 ⁵	6.01 × 10 ³
Imo	Nigeria	1.75 × 10 ⁴	2.15 × 10 ⁴	3.61 × 10 ⁴	7.92 × 10 ³	2.79 × 10 ²
Dong	China	1.57 × 10 ⁴	1.91 × 10 ⁴	3.17 × 10 ⁴	3.33 × 10 ⁴	8.54 × 10 ²
Serayu	Indonesia	1.33 × 10 ⁴	1.71 × 10 ⁴	2.99 × 10 ⁴	3.71 × 10 ³	3.70 × 10 ²
Magdalena	Colombia	1.29 × 10 ⁴	1.67 × 10 ⁴	2.95 × 10 ⁴	2.61 × 10 ⁵	5.93 × 10 ³
Tamsui	Taiwan	1.16 × 10 ⁴	1.47 × 10 ⁴	2.54 × 10 ⁴	2.68 × 10 ³	1.08 × 10 ²
Zhujiang	China	1.09 × 10 ⁴	1.36 × 10 ⁴	2.31 × 10 ⁴	4.01 × 10 ³	1.33 × 10 ²
Hanjiang	China	1.03 × 10 ⁴	1.29 × 10 ⁴	2.19 × 10 ⁴	2.95 × 10 ⁴	7.35 × 10 ²
Progo	Indonesia	9.80 × 10 ⁴	1.28 × 10 ⁴	2.29 × 10 ⁴	2.24 × 10 ³	2.79 × 10 ²
Kwa Ibo	Nigeria	9.29 × 10 ⁴	1.19 × 10 ⁴	2.08 × 10 ⁴	3.63 × 10 ³	1.92 × 10 ²

Input rate estimates (in t yr⁻¹) are representative of mismanaged plastic waste (MPW) production and catchment runoff. A lower, midpoint and upper estimate is calculated based on three regression analyses accounting for uncertainties in our field observations data set.

(Source: *Lebreton et al., 2017*).

In this article, we have put forth some of the interesting innovations and initiatives which might have futuristic advantageous contributions to save the planet. Let's explore them!

AVANI ECO-BAGS

Kevin Kumala, an entrepreneur from Bali under the brand name AVANI™ has introduced Avani bags (also known as Bio-Cassava bags) to mitigate the plastic pollution through better design, rather than waiting for a behavioural shift in consumers. These bags are bio-based alternative which have become ideal replacement to petroleum-based plastic bags.

The raw material for their manufacture is cassava (root starch), a tropical root which is a farm crop grown in several countries and other natural resins. Besides being plentiful in inventor's own native Indonesia, it is also resilient and edible. These bags biodegrade naturally into carbon dioxide and biomass, with no toxic residue in 3 to 6 months.

This however depends on soil conditions. The degradation process



can be accelerated by dissolving in hot water, softening in cold water, and burning to leave a small amount of ash.

The company claims that the Avani bags are perfect substitute for single-use conventional plastic bags. These are safely consumed by snails, insects and other land and aquatic animals. Avani claims

they are even safe for humans to drink, when dissolved in hot water. Besides this, they are safe for food packaging, have good oil resistance, good antistatic properties and oxygen barrier. These bags costs two or three cents which is double the price than a regular bag. However, Avani's co-founder thinks it is a low-cost remedy for alleviating the menace of plastic pollution.



AGAR PLASTICITY REPLACES PLASTICS

Another company named AMAM from Japan is also working towards the development of an eco-friendly plastic that only looks like plastic and can be used for packaging goods. The group includes designers; Noriaki Maetani, Kosuke Araki, and Akira Muraoka. They used agar, a gelatinous material which can be readily derived from red marine algae, a seaweed. Traditionally seaweed-derived agar has been consumed as food in Japan and used in scientific and medical fields worldwide. The properties of agar like its porosity, lightweight and feathery structure have

instigated the researchers to explore the possibility of exploiting the agar plasticity for producing packaging material.

Currently, the group is designing a box-like package, which has a cushioning structure derived from the freezing process for delicate objects (like a fragrance bottle), cushioning sheets for wrapping and nugget-like cushioning. AMAM is also exploring the possibility of agar-derived plastic material. The material can improve the water-retention property of soil, and when released into the oceans, it would obviously not pose a threat to marine lives.



Figure: Red algae as a source for agar.



Figure: Red algae as a source for agar.

NO WATER NO BOTTLE- A self-degrading bottle



Ari Jonsson, a design student at the Iceland Academy of the Arts invented a bottle made up of agar. He demonstrated his work at Design March, a design festive held in Reykjavik, Iceland in 2018. As a matter of fact, disposable water bottles are convenient but are dreadful for the environment and can be loaded with BPA's (BPA or bisphenol A). BPA stands for Bisphenol-A, an oestrogen-imitating chemical used to produce reusable plastic products. It is used to produce disposable water bottles and babies' milk bottles and plastics you might use for storing leftover food. Small amounts of BPA can leach into the food and drink inside such containers.

The presence of BPA is a concern because numerous scientific studies have shown that BPA mimics the actions of estrogen and binds to the same receptor in the body. Oestrogen is normally involved in breast development, regulating periods and maintaining pregnancies. Animals exposed to BPA develop abnormal reproductive systems. However, adverse effects associated with high doses of BPA are uncertain.

In such a case, Jonsson's innovation is a solution to a problem like this. His water bottle is made from a biodegradable material (red algae powder) which retains its shape till the time it contains liquid. But once it is empty, it starts to putrefy. Algae might be a little less predictable as far as casting the perfect bottle is concerned, but with Jonsson's method, it's super easy to check the bottle for any leaks, and can be patched up, and re-casted. The bottle also has another unusual advantage over plastic that it stays cool naturally, even in warm weather.

To create a bottle out of agar, Jonsson mixes powdered agar with water and heat it. After that it is poured into a cold mould. The mould is then swirled inside a container of ice water until the agar forms a bottle. Within a few more minutes of refrigeration, the bottle is ready for use.

Of course, it is a simple yet impeccable innovation and one of the remarkable environmental inventions of 2018 as agar is safe for both humans and environment. However, as the inventor says the project is still in its infancy and includes a many spheres to be looked at, yet, it surely deserves to be in the hands of all those who care about the ecosystem.



NEWS AT YOUR DESK...

NGT ordered stringent norms for existing and upcoming STPs in the country

The National Green Tribunal (NGT), India decommissioned the standards laid by the Ministry of Environment, Forest and Climate Change (MoEF& CC) under the 2015 CPCB (Central Pollution Control Board) draft. The new strict standards have been devised in consideration to the deteriorating condition of water bodies and unavailability of adequate dilution water in them. It is believed that implementation of such standards improve the ever growing burden on riverine systems. The tribunal emphasized that each STP has to be treated as a water resource for reuse and recycling as a mean for mitigating natural calamities such as drought or any climate change affecting the water reservoirs of the country. This can also be beneficial in maintaining the groundwater level and reduce the rainfall dependency for agriculture; which these days due to the unexpected climatic changes has become unpredictable.



In this context the tribunal directed an Expert Committee consisting of the nominees from IIT Kanpur, IIT Roorkee, NEERI and CPCB to give the report on the subject. According to the report on the status of the water quality of rivers in India, presently, 323 river stretches out of 351 are polluted. Thus, NGT suggested that there is need to revise the standards of the water quality of the rivers or water streams. Therefore, new standards have been laid which included the parameters such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), total nitrogen, etc. Among these parameters, COD has been now included as one of the major factor while constructing or operating the existing STPs over BOD. Although in the report the norms have been laid in consideration to the Mega and Metropolitan cities, yet NGT has directed to follow the same norms for other cities, towns and villages. These regions are more deprived of adequate water hygiene such as water filters or UV treatment. Thus, to meet the urgent requirements of improved water quality for better health quality, NGT has directed to apply these norms “without any delay” in the existing STPS.



ARMED FORCES TO BE DEPLOYED FOR GANGA'S PROTECTION



The Centre is all set to forward the draft National River Ganga Bill, 2018, to penalise those found polluting the river and to regulate the construction of dams on the river to the Cabinet.

The Ministry of Water Resources, River Development & Ganga Rejuvenation has finalised the draft law. The bill calls for penalising people polluting the river, defacing ghats, indulging in commercial fishing without permission and stone quarrying among others. The offenses are punishable with imprisonment up to 2 years or fine of up to INR 50,000.

The bill propose to ban the construction of jetties, ports or “permanent hydraulic structures” in the Ganga, unless permitted by the National Ganga Rejuvenation Authority. It proposes to create a management structure which will supervise the health of

the 2,500-kilometre long Ganga which, the draft Bill defines, as ‘India’s national river.’

The Bill lays down a host of restrictions to ensure the “uninterrupted, ecological flow” of the river. Currently, a host of dams in the upper stretches of the river lead to the river’s flow being obstructed. The proposed legislation specifies that “unauthorized” activities that cause obstruction or discontinuity of water in the River Ganga due to engineered diversion of water or stoppage of water. Carrying out such activities are liable to a prison term of 3 years or fines upto INR 50 Crore, or both. The Armed Ganga Protection Corps (GPC) personnel will be provided by the ministry of home affairs and will be deployed by the National Ganga Rejuvenation Authority. The GPC personnel will have power to arrest those who pollute the river covering offenses like obstructing the flow of the river to commercial fishing.



So, get informed about what you can face on polluting the “National river”.

Report of National Workshop on Arsenic Contamination and Sustainable Technological Solutions in India

Held at 26th-27th February 2019
NSHM Knowledge Campus, Durgapur, India

Sponsored By DRDO, Ministry of Defence, New Delhi

The national workshop entitled “Arsenic Contamination and Sustainable Technological Solutions in India” was organized jointly organized by NSHM Faculty of Business and Management Studies, Durgapur (West Bengal) and Save The Environment (STE), an NGO based in Kolkata totally dedicated towards the cause of environmental safety and health. The main objective of the workshop was to bring together world class researchers, scientists, environmentalists, experts and policy makers at one common platform for identifying the environmental challenges caused by arsenic poisoning of groundwater and proposing cost-effective solutions to deal with these problem. The workshop set the stage for understanding the necessity of providing arsenic free drinking water to the rural people of Bardhaman District, West Bengal and for devising plausible technological solutions for the same.

The event was inaugurated with the customary lighting of lamp in the benign presence of the Chief Guest, Shri Sapam Lenin Singh, Group Captain, Indian Air Force. Shri Singh graced the event with his thoughtful words encouraging the culmination of the workshop. Dr. Alok Satsangi, Dean Principal, NSHM School of Business and Management Studies then humbly felicitated the Chief Guest.

The welcome note was addressed by Dr. Arun Upadhyay, Member, and Organizing Committee. Dr Kshipra Misra, President, Save the Environment Foundation and Former Additional Director, DIPAS, DRDO, Delhi was kind enough to introduce STE to all present in the gathering. In her treatise, she detailed the various programs and ventures undertaken by STE to combat arsenic contamination in India, specifically in the rural areas of West Bengal. Dr. Kshipra Misra was then honorably felicitated by Dr. Alok Satsangi.

The welcome session concluded with the delivery of vote of thanks by Professor Mithun Kumar Guha, Organizing Secretary of the workshop and Assistant Professor, NSHM. The welcome session concluded with the delivery of vote of thanks by Professor Mithun Kumar Guha, Organizing Secretary of the workshop and Assistant Professor, NSHM. Faculty of Business and Management Studies, followed by recitation of the national anthem.

A high tea break was organized in the campus premises where all the participants got an opportunity for casual discussions centered around the theme of the workshop.

The first session was chaired by Dr. Kalpana Bhargava, Scientist `F' DRDO and co-chaired by Professor Prabal Chakraborty, Assistant Professor NSHM. Professor Ayan Bandyopadhyay, Member, Organizing Committee conceded as rapporteur of this session. The first talk was delivered by invited speaker, Prof. Amit Dutta, Professor, Jadavpur University, Kolkata whose lecture focused on the project “Arsenic Remediation from contaminated ground water: Field trials in Dhaphdhabi, South 24 parganas” and also discussed about the success of the project by involving multiple stakeholders and how in future this type of the project could be replicated in different parts of the country. The second invited talk was a thought provoking oration by Prof. Anupam Debsarkar, Professor, Jadavpur University, Kolkata who provided insights on the waste management while using the aforesaid technology. The first session drew to a close with the felicitation of Dr. Kalpana Bhargava by Dr. Alok Satsangi.

Post lunch, the second session of Day 1 was chaired by Dr. Kshipra Misra and co-chaired by Dr. Gargi Banerjee, Member, Organizing Committee. Professor Amrita Bhattacharya was rapporteur for the session.

A few short oral presentations made by various student and other participants.

The third session was the poster presentations, began with Dr Arun Upadhyay as the chairperson, Professor Anita Nandi Barman as the co-chairperson and Professor Dipanita Debas the rapporteur.

This session beheld a couple of poster presentations themed around water sustainability, water pollution and remediation, impact of industrial waste on water quality for agriculture and human consumption and development of simple treatment technologies.

Day 2 of the workshop was ennobled by some highly astute invited talks. The first session was gracefully opened by Dr. Razi Anwar, Chairperson, Prof. Sudip Basu, Co-Chairperson and Professor Amit Kumar Banerjee, Rapporteur. The first talk was delivered by Professor Sanjeev Chaudhary, Professor, IIT Powai. The second talk, delivered by Professor Arunava Majumdar, Professor Emeritus, Jadavpur University. Both the lectures were immensely insightful and themed on “Review of arsenic removal technologies from groundwater”. They provided a lot many inputs for arsenic remediation in water.

Session 2 was chaired by Dr Somroop Siddhanta and co-chaired by Professor Mithun Kumar Guha. Rapporteur for the session was Professor Monalisa Dutta. In this session, Dr. Mandira Ghosh, Assistant Professor, Jadavpur University an invited speaker bestowed the audience about “arsenic in rice grain: risks and challenges”.

In this session, Dr. Mandira Ghosh, Assistant Professor, Jadavpur University an invited speaker bestowed the audience about “arsenic in rice grain: risks and challenges”. Both the sessions of Day 2 were followed by certain oral presentations by several other participants.

The final session of the workshop began with Professor Prabal Chakraborty providing glimpses of the workshop, under

“Workshop at a Glance”. This was followed by release of souvenir and recommendations by Professor Arunava Majumdar. The valedictory function was conducted by conferring felicitations on winners of oral and poster presentations as well as felicitation of the Management Faculty Members.

The final curtain on the much successful workshop was drawn with the vote of thanks addressed by Professor Mithun Kumar Guha who, on behalf of the entire fraternity, expressed his gratitude and satisfaction regarding the interactive proceedings and extensive networking that had taken place over two days. Which he hoped would continue moving constructively forward.







UPCOMING CONFERENCES ON ENVIRONMENTAL SCIENCES

- ❖ 9th International Conference on Environment Science and Biotechnology (ICESB 2019) will be held during December 28-30, 2019 in Phuket, Thailand. ICESB 2019 brings together innovative academics and industrial experts in the field of Environmental and Agriculture Engineering to a common forum.
- ❖ 11th International Conference on Environmental Science and Development (ICESD 2020) will be held during February 10-12, 2020 in Barcelona, Spain. ICESD 2020 brings together innovative academics and industrial experts in the field of Environmental Science and Development to a common forum.
- ❖ 5th World Congress on Environmental Science is scheduled in Toronto, Canada during August 19-20, 2019.
- ❖ 9th Edition of International conference on Environmental Science & Technology during June 24-25, 2019 at Holiday Inn Moscow Vinogradovite, Moscow, Russia. The theme of the conference is “Lets join hands & go green for Mother Nature”.
- ❖ Participate in the 16th International Conference on Environmental Science and Technology (CEST2019). The conference will be held in the island of Rhodes, Greece from 4 to 7 September 2019. The conference is organized by the University of the Aegean (Greece) together with the South Aegean Region and is supported by the University of Salerno (Italy) and the Imperial College London (UK). The main organizer is the multi-disciplinary Global NEST (Network of Environmental Science and Technology); an international scientific movement that has been successfully developing for the last 29 years with members from more than 60 countries. Global NEST is an international scientific movement focusing on innovative environmental issues.
- ❖ Register for the 6th World Conference on “Climate Change” to be held in Berlin, Germany from September 2nd to 3rd, 2019. The theme of the conference is “An Insider's View of Climate Science, Politics, and Solutions”.
- ❖ The 29th Irish Environmental Researchers Colloquium (Environ 2019), will be held at the Institute of Technology Carlow from April 15th to 17th 2019. This year's event is organised via a collaboration between the Environmental Sciences Association of Ireland (ESAI) and the Institute of Technology Carlow; the organising team are working fervently to put an exciting programme in place and will be delighted to welcome you in Carlow in April.
- ❖ International Conference on Environment and Natural Science from 16 to 17 December 2019 at Radisson Hotel, JFK Airport, Queens County, USA. The International Conference on Environment and Natural Science conference is to promote research and developmental activities in Environment and Natural Science. And the conference is promote to scientific information interchange between researchers, developers, engineers, students, and practitioners working in and around the world.
- ❖ 8th International Ground Water Conference (IGWC), 2019 is to be held during the period 21st to 24th October, 2019 at IIT, ROORKEE, India. The international conferences in IGWC series are the meeting point for groundwater professionals and researchers, bringing together experts in the various inter-related disciplines in the field of groundwater hydrology. The aim of IGWC 2019 is to provide a common platform for researchers, academicians, water managers, industrialists and technocrats to discuss and present their vision for Sustainable management of soil-water resources to face the growing challenges of the needs of rising population and anticipated impacts of land use and climate change.



एक ही संकल्प हमारा,
प्लास्टिक हटाना लक्ष्य
हमारा।



Say **No To**
Plastic Slogans



Plant a TREE, SAVE the planet!



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