ONLY NEWS PAPER PUBLISHED IN INDIA FOR SCIENTIFIC COMMUNITIES

NESA

NATIONAL ENVIRONMENTAL SCIENCE ACADEMY

Vol. 23 Issue - 01 (MONTHLY) January 2020

To all NESA Members from NESA Office Bearers and Staff

NESA Annual Award 2020 Notification No. 1

APPLICATIONS ARE INVITED

31st May 2020

(1) NESA FELLOWSHIP AWARD

AGE 45 and above. The recipients shall get Citation, Certificate, Memento and a Gold plated medal, and can suffix F.N.E.S.A. after their names.

(2) NESA EMINENT SCIENTIST AWARD

AGE 40 and above. The recipient shall get Citation, Certificate, Memento and a Gold plated medal.

(3) NESA SCIENTIST OF THE YEAR AWARD

AGE 35 and above. The recipient shall get Citation, Certificate, Memento and a Gold plated medal.

(4) NESA ENVIRONMENTALIST AWARD

AGE Up to 35 and above. The recipients shall get Citation, Certificate, Memento and a Gold plated medal.

(5) NESA GREEN TECHNOLOGY INNOVATIVE AWARD

AGE 35 and above. The recipients shall get Citation, Certificate, Memento and a Gold plated medal.

(6) NESA YOUNG SCIENTIST AWARD

AGE : Up to 35. The recipients shall get Citation, Certificate, Memento and a Gold plated medal.

(7) NESA JUNIOR SCIENTIST AWARD

AGE : Below 35. The recipients shall get Citation, Certificate, Memento and a Gold plated medal.

PRESCRIBED APPLICATION FORMS

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

Separate application form should be submitted for separate awards. The application forms are non-transferable and it can also be obtained by sending a bank draft of **Rs. 1000/- only** (per form). Drawn in favour of **NATIONAL ENVIRONMENTAL SCIENCE ACADEMY** payable at NEW DELHI.

***Please log on to our website for Guidelines.**

GENERAL SECRETARY
NATIONAL ENVIRONMENTAL SCIENCE ACADEMY
206, Raj Tower-I, Alaknanda Community Centre,
New Delhi - 110 019 • **Tel.: 011-2602 3614**
E-mail: infonesa88@gmail.com
Website: www.nesa-india.org

List of NESA Annual Awardee 2019

NESA Fellowship of the Year Awardee 2019

Prof. Kushal Kumar Baruah
Professor & Dean
Royal Global University
Guwahati, Assam

Dr. Gopal Lal
Director
National Research on Seed Spice
ICAR, Tabiji Farm
Ajmer, Rajasthan

Dr. Ram Roshan Sharma
Principal Scientist (Horticulture)
Division of Food Science & Postharvest Technology
ICAR, New Delhi

Prof. (Dr.) Tasneem Fatma
Professor
Department of Biosciences
Jamia Millia Islamia
Jamia Nagar, New Delhi

Prof. Santh Rani Thakur
Professor
Institute of Pharmaceutical Technology
Sri Padmavti Mahila Visvavidyalaym
Tirupati

Dr. Rajeeb Kumar Mohanty
Principal Scientist (Aquaculture)
ICAR Indian Institute of Water Management
Bhubaneswar, Odisha

Prof. Dipak Sinha
Professor
Department of Chemistry
Nagaland University
Lumami, Nagaland

Dr. Zeba Parveen
Principal
Bi Bi Raza Degree College for Women's and Research Centre
Gulbarga, Karnataka

Dr. Srinivasa Brahmana Pothula
Principal Scientist
Agronomy
ICAR-IIWM, Bhubaneswara
Indian Institute of Water Management,
Chandrasekhpur, Bhubaneswar, Odisha

Prof. Mohd. Kamil Usmani
Professor
Department of Zoology
Aligarh Muslim University
Aligarh, Uttar Pradesh

Prof. Dinesh Rangappa
Professor and Program Co-ordinator
Department of Nanotechnology
Visvesvaraya Technological University
Muddenahalli, Chikkballapura, Karnataka

Prof. Jayalaxmi Narayan Hegde
Professor of (Agricultural Entomology)
University of Agriculture Science and Horticulture Science
Shivamogga, Karnataka

Prof. Arutchelvan Veeraraghavan
Professor
Department of civil Engineering
Annamalai University
Chidambaran, Tamilnadu

NESA Eminent Scientist of The Year 2019

Dr. Pujari Kadappa Basavaraja
Professor and Scheme Head
University of Agriculture Sciences
GKVK, Bengaluru

Dr. Asimul Islam
Assistant Professor
Centre for Interdisciplinary and Basic Sciences
Jamilia Milia Islamia, New Delhi

Dr. Shachi Shah
Associate Professor
School of Interdisciplinary and Trans-Disciplinary Studies
Indira Gandhi National Open University
New Delhi

NESA Scientist of the Year Awardee – 2019

Dr. Satyanarayana C.
Assistant Professor
College of Horticulture of Agricultural Entomology
Halladkeri Farm, Hyderabad Road, Bidar,
Karnataka

Dr. Raghavendar Kumar Kanjke
Associate Professor
School of Atmospheric Physics
Nanjing University of
Information Science Technology
Nanjing, China-210044

Dr. V. Jaisankar
Associate Professor
Department of Chemistry
Presidency Collage, Chennai-600005
Tamil Nadu

Dr. N. John Sushma
Assistant Professor
Department of Biotechnology
Sri Padmawti Mahila University
Tirupati, Andhra Pradesh

Dr. Jyoti Ranjan Rout
Assistant Professor
School of Biological Sciences
Asian Institute of Public Health -
[AIPH] University
Lewis Road, Nageswar Tangi
Bhubaneswar, Odisha

Dr. P. Rajendran
Associate Professor
Department of Agroforestary
Forest College and Research Institute
Mettupalayam, Coimbatore, Tamilnadu

Dr. K. Radhika
Women Scientist –A
Department of Soil Sciences and
Agriculture Chemistry
Tamil Nadu Agricultural University
Coimbatore, Tamilnadu

Prof. (Dr.) Tejappa Bhimappa Allolli
Professor of Horticulture and Registrar
University of Horticulture Sciences
Navanagar, Bagalkote, Karnataka

Prof. Monika Sachdeva
Principal
RKG Institute of Technology
Meerut Road, Ghaziabad, Uttar Pradesh

Dr. Prithidipa Sahoo
Assistant Professor
Department of Chemistry
Siksha Bhavana Institute of Sciences
Visva Bharti, Santiniketan, West Bengal

Dr. Abid Ali Ansari
Assistant Professor
Department of Biology
Faculty of Science
University of Tabuk
Tabuk, Saudi Arabia

Dr. Prasant Vasant Rao Shende
Professor (CAS)
Professor of Agriculture Botany
College of Agriculture, Nagpur, Maharashtra

List of NESA Environmentalist of the Year Awardee - 2019

Dr. Amalesh Bera
Assistant Teacher
Keshia Saroj Kumar High School
Kiaboni, Pashchim Midnapur, West Bengal

Dr. Komal Kumar Javarappa
Scientist
Institute of Molecular Medicine
University of Helsinki, Finlandc

Dr. Smriti Tripathi
Assistant Professor
Department of Environment Science
Bundelkhand University, Jhansi, U.P.

Dr. Pothagani N. Siva Prasad
Assistant Professor
Department of Soil Science and
Agriculture Chemistry
SBVR Agriculture Collage
Kadapa, Andhra Pradesh

Dr. G. Suhasini
Assistant Professor
Head, Dept. of Zoology
SRR Govt. Arts and Sciences College
Karimnagar, Telengana

Mr. Manglesh Kumar Jawalkar
Research Fellow
Department of Environment Science and Limnology
Barkatullah University
Bhopal, Madhya Pradesh

Dr. Pradip Kumar Pattajoshi
Manager
(Environment) NALCO
Department of Environment
NALCO, Damanjodi, Odisha

Dr. Shashi Shekhar T. R.
Associate Professor
Department of Civil Engineering
East West Institute of Technology
Sy. No-63, Anjana Nagar, Magadi Road
Bengaluru, Karnataka

Dr. Alka Rani
Associate Professor
Hindu (P.G.) College
Budh Bazar, Moradabad, Uttar Pradesh

NESA Green Technology Innovative Award 2019

Dr. Devendra Mani Tripathi
Assistant Professor
Department of Microbiology
Bundelkhand University
Jhansi, Uttar Pradesh

Dr. Tarun Kumar Bera
Assistant Teacher
Moyna Purananda Vidyapith
Moyna Purba Midnapur, West Bengal

Dr. Balaraman Ekambaram
Assistant Professor
Department of Chemistry
Indian Institute of Science Education and Research (IISER)
Tirupati, Andhra Pradesh

Dr. Swaroopa Rani
Associate Professor
Department of Biotechnology
Jawaharlal Nehru Technological University
Anantapur, Andhra Pradesh

Dr. Pramod Kumar
FAE-Ecology & Biodiversity
Environmental Department
CMPDI, Ranchi, Jharkhand

NESA Young Scientist of the Year Awardee – 2019

Dr. Ravikiran Ningappa Kulloli
Post Doctoral Fellow
Botanical Survey of India
Arid Zone Regional Circle, Link Road
Subhash Nagar, Jodhpur, Rajasthan

Dr. Rishi Rana
Assistant Professor
Department of Civil Engineering
Jaypee University of Information Technology
Wakhnaghat, Solan, Himachal Pradesh

Dr. Ram Dayal
Director & Senior Embryologist
IRCC Multispeciality Hospital
Sector 17, Panchkula, Haryana

Dr. Manojit Bhattacharya
Project Coordinator
Department of Zoology
Vidyasagar University
Midnapur, West-Bengal

Dr. Mallikarjuna Jeer
Scientist (Entomology)
ICAR-National Institute of
Biotic Stress Management
Raipur, Chhattisgarh

Mr. Rajaobul Reddy Kalluri
Research Associate
Department of Physics
Sri Krishnadevaraya University
Anantapur, Andhra Pradesh

Dr. (Mrs.) Rachana Dubey
Scientist
ICAR, Indian Institute of Water Management
Bhubaneswar, Odisha

Dr. Ab Latif Wani
Research Associate
Department of Zoology
Faculty of Life Sciences
Aligarh Muslim University
Aligarh, Uttar Pradesh

Dr. M.R.A. Manimala
Assistant Professor
Agriculture Microbiology
Mother Terasa College of Agriculture
Tamilnadu

Dr. Demudu Gajji
Post-Doctoral Fellow
Department of Geography
Andhra University
Visakhapatnam, Andhra Pradesh

Dr. Anju Chauhan
Research Assistant
Pollution Ecology Laboratory
Department of Botany
Hindu College
Muradabad, Uttar Pradesh

Dr. Sushma Rani
Senior Research Fellow
Room No-129, ICAR-NIPB Lab
LBS Building, ICAR Pusa Campus
New-Delhi

Dr. Sushil Satish Rao Chhapekar
Post-Doctoral Fellow
College of Agriculture and Life Science
Chungnam National University,
99 Daehak-ro, Oncheon 2(i)-dong,
Yuseong-gu, Daejeon, South Korea

NESA Jr. Scientist of The Year Awardee – 2019

Mr. Saubhagya Singh
Research Scholar
Department of Environment Sciences
Bundelkhand University
Jhansi, Uttar Pradesh

Mr. Atul Kumar
Project Fellow
Department of Botany
Hindu Collage
Moradabad, Uttar Pradesh

Dr. Jamuna B.
Research Scholar
Food Quality Laboratory
University of Agriculture Science
Raichur, Karnataka

Mr. Chakradhar Tandule
Senior Research Fellow
Department of Physics
Sri Krishnadevaraya University
Anantapur, Andhara Pradesh

Mrs. Rinki Mishra
Junior Research Scientist
Department of Environment Sciences
Dr. B. Lal Institute of Technology
Jaipur, Rajasthan

Ms. Badar Jahan
Research Scholar
Department of Botany
Aligarh Muslim University
Aligarh, Uttar Pradesh

Mr. Shrikant Gangwar
Ph.D Scholar
Department of Environment Science & Limnology
Barkatullah University
Bhopal, Madhya Pradesh

Ms. Neha Singh
Assistant Manager
Ramky Environment Engineering Pvt. Ltd.
Ramky Tower, Hyderabad

Mr. Atun Roy Choudhary
Scientific Officer
Ramky Environment Engineering Pvt. Ltd.
Ramky Tower, Hyderabad

Dr. Karthik Kesiraju
Ph.D Scholar
LAB-No-106, LBS Building
ICAR-National Institute for Plant Biotechnology
PUSA Campus, New-Delhi

Mr. Mrutyunjay V. Matti
Ph.D Scholar in Agriculture Entomology
University of Agriculture Sciences
Dharwad, Karnataka

Mr. Pushpender Sharma
Sr. Embryologist
Indian IVF Center, Fortis Hospital
Vasant Kunj, New Delhi

Dr. Sahil Mor
Research Scholar
Department of Environment Sciences and Engineering
Guru Jambheshwar University of Science & Technology
Hissar, Haryana

1st Day (19th Dec. 2020) Glimpses of NESA Annual Award and MESSAGE International Conference At VTU











2nd Day (20th Dec. 2020) Glimpses of NESA Annual Award and MESSAGE International Conference At VTU











VEHICULAR POLLUTION: CAUSES AND PREVENTION

Amarjit K Nath[1] and Satish K Sharma[2]
[1]Professor (Biochemistry) Dr YS Parmar UHF, Nauni, Solan
[2]Biochemist, SKAUST-J
E-mail: *nathamarjit60@gmail.com*

The word vehicle has been derived from Latin word 'vehiculum' , from vehere that means 'to carry'. Thus it does seem ironical that the 500 million-plus vehicles using world's roads 'carry' on mass contamination of its environment which in turn 'bears' catastrophic consequences. Thus vehicular pollution is a global issue drawing the concerns of environmentalists, policymakers, car manufacturers and owners as well as buyers alike.

It mainly includes noise and air pollution. Noise is a combination of fluctuating sound waves that repeat themselves in a highly haphazard manner. In highly industrialized and urbanized areas unorderly and mismanaged movement of heavy traffic causes sounds of vehicle engines and horns to blend and form a cacophony of blaring noises or noise pollution. Prolonged exposer to this high-frequency noise can impair hearing ability, have serious physiological and emotional impacts, lead to annoyance, increase blood pressure and affect the functioning of the heart.

The other aspect of vehicular pollution i.e. air pollution is an equally perturbing subject as the former. Vehicles are in fact the premier contributor to air pollution in the world today. The extent of rising in air pollution in densely populated areas (both in terms of people and vehicles) is so much that the following sarcastic comment proves quite effective in describing the present dilemma appropriately. It states that – ' there is so much pollution in the world today, that if we weren't for our lungs, where would we keep it'. However, here the veils of black humor fail to cover the grimness of the reality. Vehicular emissions on building up in the atmosphere directly affect the cardiovascular system of humans and causes diseases like asthma, bronchitis, allergies, lung disease and heart disease. An example of these emissions is carbon monoxide (CO) which is produced on the burning of fuel in the absence of air. This gas, when inhaled, reacts with hemoglobin in the blood to form carbonyl hemoglobin, a compound that does not favor the transportation of oxygen in the blood. Excessive inhalation of this gas leads to loss of consciousness followed by subsequent death. Carbon dioxide, water vapors, and other greenhouse gases facilitate the rise in the atmospheric temperature or in other words greenhouse effect. Owing to automobile exhaust the percentage of these gases in the atmosphere is on the rise. Consequently, the heat-trapping ability of earth air blanket is also increasing leading to a worldwide rise in average local temperature. This phenomenon is known as global warming. Some scientists believe that if the process continues at the present rate the polar ice caps would melt leading to a rise in sea level by as much as 60 meters. Lord may the president of the Royal Society, Britain's leading scientific institution-issued this apocalyptic statement on global warming and climate change: " Never before have we faced such a global threat. And if we do not begin effective action now, it will be harder to stop the runaway train as it continues to gather momentum". So we can conclude that the toll of vehicle-borne air pollution on human health and ecology is tremendous. It also gives birth to soil and water pollution due to acid deposition as a result of gaseous pollutants

like nitrogen (II) oxide (NO) and sulfur dioxide (SO_2) which form a considerable part of the exhaust of diesel-powered motor vehicles.

The wheel is credited to be the greatest invention in the course of human civilization. However, according to some critics car is the most ineffective machine in today's world. According to an article published in the renowned magazine 'Scientific American':, Transportation consumes 70 percent of U.S. oil and generates a third of the nations carbon emissions. It is widely considered the most intractable part of the climate problem, especially as hundreds of millions of people in China and India buy automobiles.

Thus for the car, it is essential to become more fuel-efficient, only then will it be able to make its ancestor (wheel) proud. Winning the Oil Endgame, a 2004 analysis written by a team working at the Rocky Mountain Institute (RMI) in the U.S.A. and co-sponsored by the Pentagon, found that artfully combining lightweight materials with innovation in propulsion and aerodynamics could cut oil use by cars, trucks by two-third without compromising comfort, safety, performance or affordability.

Amory B. Lovins of the Rocky Mountain Institute has expounded the same through the use of physics: ' Despite 119 years of refinement, the modern car remains astonishingly inefficient. Only 13 percent of its fuel energy even reaches the wheels- the other 87 percent is either dissipated as heat and noise in the engine and drive train or lost to idling and accessories such as air conditioners. Of the energy delivered to the wheels, more than half heats the tires, road, and air. Just 6 percent of the fuel energy actually accelerates the car (and all this energy converts to brake heating when you stop). And, because 95 percent of the accelerated mass is the car itself, less than 1 percent of the fuel ends up moving the driver'. Thus, the obvious solution offered by him to the problem of vehicle-borne air pollution lies in greatly reducing the car's weight.

The use of alternative combustion fuels can also make cars more efficient. Among the alternatives, eco-friendly fuels that have been developed to date are biofuels, hydrogen fuel-cell, electricity, and natural gas. Biofuels are those which are produced from biomass. Ethanol is a major biofuel which is used on its own or mixed with petrol. It is made from maize and certain other crops. Hydrogen fuel-cell vehicles are the most efficient in the lot. The only by-product produced in the process of its combustion is water. The fuel has a good range and the vehicle moves smoothly

producing negligible noise. Hydrogen fuel- cells are produced through the following two methods: i) obtaining hydrogen by burning fossil fuel, however taking into consideration the dwindling energy resources and the effects of air pollution which have been discussed earlier this method does not seem viable from the ecological point of view. ii) the use of wind energy in order to obtain hydrogen, however, at present it is highly expensive. The hydrogen fuel-cell vehicle (HFCV) produced by the Company Toyota is priced currently at 1 million dollars.

Electricity powered vehicles also don't produce greenhouse gases, however, their range is limited and the batteries are to be recharged daily. Further, fossil fuels are still the most widely used energy source for the production of electricity (they produce more than 80 percent of the world's energy according to 1998 data) Hybrid electric vehicles (HEV) use both electricity and petro/ diesel to drive the internal combustion engine. Its mechanism is such that at low speed the car is driven by the electric battery. Therefore, the range of fuel is higher in comparison to vehicles entirely powered by electricity and emissions from internal combustion engines are lesser as compared to its petrol/diesel-run counterparts. Natural gas (L.P.G and C.N.G) is the most preferred of all alternative combustion fuels as it is more economical. The legislation passed by the Delhi government allowing only C.N.G (Compressed Natural Gas) powered buses and autorickshaws to be driven on the streets has greatly improved the air quality in the national capital. This program should be followed up in all the major cities of the country.

There is also a need to prepare special devices which would help in reducing noise while the engine is in operation All vehicles should be fitted with soft horns and silencers of good quality in order to combat noise pollution and its detrimental effects on human health.

The government can [pass legislation mandating the fitting of catalytic converters, raising the height of exhaust pipes and using only unleaded petrol and diesel in vehicles. Catalytic converters are helpful as they convert some of the toxic exhaust gases to less polluting car dioxide (CO_2) and water through chemical reactions. Children are more susceptible to respiratory disorders because of the low heights of the exhaust pipes. If the are fitted towards the top the direct effect on children can be avoided to some extent. Lead in fuel interferes significantly with learning abilities and the mental capacity of children, so it should be phased out.

Traffic management is also an important step towards prevention from vehicular pollution. It includes the incorporation of highways and flyovers in town planning. This would help in the free flow of traffic as such both air and noise pollution would be reduced. Likewise, planting trees along roads would also help in achieving these objectives.

The government should also set apart a certain sum for waterways and railways for transportation of cargo as in comparison to trucks, ships and trains cause far less pollution. The policy of charging fees on inefficient new cars and rewarding the buyers of efficient models can be brought into in order to yield far-reaching consequences.

Any national program in a democracy will become successful only when there is a cooperation between those who govern and the governed. Therefore, individuals must be vigilant and indulge in the purchase of vehicles that are fuel-efficient and equipped with modern technology. They must not buy cars with sharp horns and high-frequency stereo systems. Citizens must prefer the use of public transport like buses, metros and public trains instead of private vehicles while going to the office or on other daily chores. Or else sharing vehicles and taking turns in dropping colleagues to work is also a good practice and can also prove equally effective. Certain zones of the city can be marked as no vehicle zones, here walking, cycling or skating would be encouraged. A task force of citizens can also be formulated to monitor and register reports of vehicles emitting carbon from their exhaust. People must go in for regular servicing and genuine pollution checks.

In my opinion, cycling is the best means of ensuring a healthy environment for posterity and vanquishing chronic ailments. So the next time one remembers that he/she has forgotten to bring salt from the market, reflect a little before turning the car around that maybe it would be better to ride the cycle and live by the sage principle of 'burning fat and not oil'.

WASTE DECOMPOSER AND ITS APPLICATIONS

Dr. C. Padmapriya[1] and Dr. M.R.A. Manimala[2]
[1]Agricultural officer, Seed Processing Unit, Dindigul, Tamil Nadu; [2]Assistant Professor, Mother Teresa College of Agriculture, Pudukottai, Tamil Nadu
Corresponding author: *agri.padma@gmail.com*

Agricultural crops generate considerable amounts of leftover residues, with increases in food production crop residues also increasing. These leftover residues exhibit not only resource loss but also a missed opportunity to improve a farmer's income. The uses of crop residues in various fields are being explored by researchers across the world in areas. In India more than 500 mt crop residues are produced annually and most of which belongs to cereals. The main cause of concern in rural population is the management of agricultural waste. The most common practice is usually to burn these residues or to leave them to decompose. In this regard one microbial consortia namely waste decomposer is developed by NCOF (National Centre for Organic Farming), Gaziabad. It acts as biofertilizer, biocontrol and soil health reviver. It can also be used in various ways such as quick composting of bio

waste, foliar spray as biopesticide for the control of diseases by producing antimicrobial metabolites, in-situ composting of crop residue and seed treatment.

Method of multiplication

Take 200 liters of water in a plastic drum

⇩

Add 2 kg of jaggery and mix in water

⇩

Add 1 bottle of waste decomposer consortia

OR

20 liter of prepared waste decomposer solution

⇩

Mix it properly with wooden stick for uniform distribution of material

⇩

Cover the drum with paper or cloth

⇩

Stir the solution twice a day for 5-7 days

⇩

Waste decomposer is ready for application

Method of application:

Bio-pesticide:

Mass multiplied culture diluted in 1:3 ratio with water and applied as foliar spray. It controls the diverse groups of insect and diseases.

***In-situ* composting of crop residue:**
Apply 500 lit/ha mass multiplied culture as soil spray or with irrigation water.

TRADITIONAL USE OF MEDICINAL PLANTS AMONG TRIBAL COMMUNITIES OF MAIKAL HILLS IN CENTRAL INDIA

Nitesh Singh[#1], Amrita Singh[2], Aadil Mansoori[1], Shasi Pandey[3] and Pratibha Singh[4]

[1]Botany, Indira Gandhi National Tribal University (IGNTU), Amarkantak-484887, India; [2]Department of Botany, University of Delhi, New Delhi- 110001, India; [3]National Institute of Plant Biotechnology (NIPB), New Delhi- 110012, India.
[4]Botany, Udai Pratap Autonomous College, Varanasi -221002, India
#E-mail: *nitesh.mau.singh@gmail.com, niteshigntu@gmail.com*

India has been rich in its tribal population since time immemorial with its traditional knowledge network that addresses the many important aspects and health issues of tribal communities. Use their traditional knowledge and understanding of nature and local practitioners as well as their own herbal research, tribal people get their remedy. In present scenario due to loss of traditional knowledge and declining plant population organized studies were initiated but then also in Central India of indoor areas like core zone and buffer zone villages of Achanakmar-Amarkantak biosphere reserve plants become the only source of medicine and well-being. Nonetheless, information on plant uses as traditional medicines has not been recorded from various central India regions of interior areas such aslamni, birarpani, chhirhatta, Atariya, Ranchaki, Amadob, kewanchhi, Piparkuthi, Madana and many other nearby areas. Recently there has been study of 27 tribal communities like the main tribes in this region are the Agaria, the Asur, the Baiga, the Bhils, the Bhuinya, the Bhumij, the Birhor, the Bondo, the Borida, the Gadava, the Ho, the Juang, the Kamar, the Katkari, the Kharia, the Kol, the Kondh, the Koraku, the Lodha, the Munda, the Muria, the Oraon, the Pardhan, the Santal / Santhal, the Savara and so on inhabit in 418 villages. Documentation of traditional knowledge, particularly concerning the medicinal use of plants, has given many important modern-day drugs. This region still holds much more hidden treasure today, as nearly 80 percent of the human population in developing countries rely on plant healthcare resources.

Medicinal plants and methods of using medicinal plants vary by community depending on the location of the tribal community and the availability of medicinal plants in the area.

Sr.No.	Botanical name	Local name	Family	Use
1.	*Abelmoschus moschatus*	Charmukhi	Malvaceae	Root Malaria, Itching, Hair loss, Jaundice, Body pain
2.	*Achyranthes aspera*	Chirchita	Amaranthaceae	Used to burns, bronchitis, flu, cough, diarrhea, colic, fatigue, ear infections, headache
3.	*Asparagus racemosus*	Satawar	Liliaceae	It is believed to boost female reproductive health, reducing symptoms of menopause
4.	*Bacopa monnieri*	Brahmi	Plantaginaceae	Used for memory-enhancement activity as well as could be utilized as nootropics
5.	*Begonia picta*	Patharchata	Begoniaceae	Headache, Eye wash
6.	*Canavalia gladiatum*	Ban Semi	Fabaceae	Root used for body pain, and diarrhoea
7.	*Canna indica*	Bajranti	Cannaceae	Root Fever, Wounds
8.	*Celosia argentea*	Safed murga	Amaranthaceae	Constipation
9.	*Chenopodium album*	Bathua bhaaji	Amaranthaceae	Useful in piles, heart tonic, kidney stone, keeping digestive system healthy, jaundice, anemia, irregular period.
10.	*Chlorophytum borivilianum*	Haddi mushli	Asparangaceae	Sex tonic, safe alternative to Viagra
11.	*Cissusqu adrangularis*	Hadjod	Vitaceae	Bone fracture
12.	*Cissus vitiginea*	Ban Angur	Vitaceae	Used for the treatment of wounds, diabetes, cardiovascular disease, cancers, particularly bone disease and arthritis

13.	Costus speciosus	Kev kand	Zingiberaceae	diabetes, nausea, diseases of the respiratory tract, gastrointestinal disorders, leprosy, infertility, pain, urinary disorders, eye and ear infections, sexually transmitted diseases, leucorrhea, and urinary clearing
14.	*Crotalaria spectabilis*	Jungli san	Fabaceae	used in the treatment of scabies and impetigo, shown to lower blood pressure
15.	*Curculigo orchioides*	Kali mushli	Agavaceae	It tones the renal, adds energy and serves as a general tonic, diuretic, demulcent and aphrodisiac
16.	*Cynoglossusm lanceolatum*	Kamraj	Boraginaceae	Root Eye trouble, Fever
17.	*Dioscorea bulbifera*	Zimikand	Dioscoreaceae	It is used for the treatment of dysentery, syphilis, ulcers, cough, leprosy, diabetes, asthma, and cancer. Also used as contraceptives.
18.	*Echinochloa colona*	Jungli sama	Gramineae	Used by grazing animals as fodder and it cures ingestion. Also used to prepare a food dish khichdi.
19.	*Eryngium foetidum*	Jungli dhania	Apiaceae	Used to treat burns, earache, fevers, vomiting, constipation, fits, asthma, stomach ache, worms, symptoms of abortion, snake bites, diarrhea and malaria.
20.	*Eulaliopsis binata.*	Babui	Poaceae	Treat cuts and wounds of papillae and domestic animal lesions
21.	*Hedychium coronarium*	Gulbkawali	Zingiberaceae	used for febrifuge, tonic , bruises sprains, and gargling in tonsillitis or simply as a mouth wash to avoid bad breath.
22.	*Lantana camara*	Barmasia	Verbenaceae	Used to treat cancer, skin itches, leprosy, rabies, chicken pox, measles, asthma and ulcers
23.	*Macaranga peltata*	Chand kal	Euphorbiaceae	Treat malnutrition, dysentery, haemoptysis, cough and fever. The leaves, and sometimes the resin, are added to cuts, ulcers, sores and boils externally.
24.	*Madhuca indica*	Mahua	Sapotaceae	Fruit, Flower Delivery convalescence, Skin cracks, Weakness
25.	*Mimosa pudica*	Chui mui	Fabaceae	Care of urogenital conditions, drops, dysentery, sinuses, and also wound care.
26.	*Mucuna pruriens*	Jungle kevanch	Papilionaceae	Seed Nervous system problems, Sexual debility and Sun stroke.
27.	*Murraya koenigii*	Mitha neem	Meliaceae	Used in vomiting, fever, diarrhoea, and control diabetes.
28.	*Nepeta cataria*	Badranj boya	Lamiaceae	Treat the intestinal cramps for indigestion, cause sweating, induce sedative menstruation and increase appetite.
29.	*Ocimum gratissimum.*	Jangli tulsi	Lamiaceae	Used as a general tonic and anti-diarrheal agent and to treat conjunctivitis by instilling it directly into the eyes; used as a lotion for skin infections and taken internally for bronchitis.
30.	*Panicum antidotale*	Kutki	Poaceae	The smoke from the burning plant is used to fumigate the wounds and to treat smallpox as a disinfectant
31.	*Paspalum scrobiculatum*	Kodo	Poaceae	Grains used in Diabetes care
32.	*Phyllanthus niruri*	Bhui amla	Euphorbiaceae	Used for kidney stones, gallstones, diabetes and liver safety.
33.	*Portulaca oleracea*	Nuniya bhaji	Portulaceae	acting as a febrifuge, antiseptic, and vermifuge
34.	*Scoparia dulcis*	Meethi buti	Plantaginaceae	Digestive, pulmonary, fever, skin, hypertension, hemorrhoids, diarrhea, dysentery, bites of insects, anemia, albuminuria, diabetes and herpes
35.	*Sisym briumirio*	Jungli rye	Cruciferae	Used to treat cough and coughing in the lungs, rheumatism, liver and spleen detoxification, reduction of swelling and cleaning of wounds
36.	*Smithia conferta*	Naichi bhaji	Fabaceae	Used to treat ulcer, uterine trouble and known as “Lakshman booti”
37.	*Swertia alba*	Chirayta	Gentianaceae	Used to treat piles, skin conditions, ulcers and diabetes
38.	*Szygium cerasoides*	Naichi bhaji	Myrtaceae	Used for making tea. Uses such as antibacterial, anti-hyperglycemic, gastro-protective, stomach disease.

39.	*Terminalia chebula*	Harra	Combretaceae	Used for high cholesterol and digestive disorders including diarrhoea and constipation as well as indigestion. also used to treat people with HIV.
40.	*Thalictrum foliolosum*	Mameera	Rananculaceae	Effective cure for atonic dyspepsia and is also useful for the diagnosis of peptic ulcers, indigestion, fevers, toothache, haemorrhoids and for recovery from acute diseases, juice used for pimples.
41.	*Urginea indica*	Jangli pyaj	Liliaceae	cures headaches, diseases of the nose, rheumatism, chronic nephritis, ringworm, leprosy and scabies, increase urine so diuretic properties,

List of plants


Abelmoschus moschatus


Achyranthes aspera


List of plants


Asparagus racemosus


Bacopa monnieri


Canavalia gladiatum


Canna indica


Celosia argentea


Chenopodium album


Chlorophytum borivilianum


Cissusqu adrangularis


Cissus vitiginea


Costus speciosus


Crotalaria spectabilis


Curculigo orchioides


Cynoglossusm lanceolatum


Dioscorea bulbifera


Echinochloa colona


Eryngium foetidum


Eulaliopsis binata


Hedychium coronarium


Lantana camara


Macaranga peltata


Madhuca indica


Mimosa pudica


Mucuna pruriens


Murraya koenigii


Nepeta cataria


Ocimum gratissimum


Panicum antidotale


Paspalum scrobiculatum


Phyllanthus niruri


Portulaca oleracea


Scoparia dulcis


Sisym briumirio


Smithia conferta


Swertia alba


Szygium cerasoides


Terminalia chebula


Thalictrum foliolosum


Urginea indica

POLLINATOR SANCTUARIES: A NEW POLLINATOR CONSERVATION MODEL FOR SMALL ISLAND NATIONS

S. K. Basu[1*] and A. M. Fernandez[2]
[1]PS Lethbridge, AB Canada T1J 4B3; [2]School of Agriculture & Food Technology, The University of the South Pacific, Private Mail Bag, Apia, Samoa;
*corresponding author: *saikat.basu@alumni.uleth.ca*

Insect pollinators like bees (honey bees and native bees), moths and butterflies, and pollinator friendly species of beetles and flies are showing a trend of gradual decline across the planet. A number of natural and anthropogenic factors are responsible for this but the bee populations, in particular, are the worst impacted. Environmental pollution, over application of agro-chemicals, changes in the land use patterns, industrial agriculture, parasitic diseases, lack of sufficient foraging plants, and access to adequate multi-species nutrition is some of the factors impacting bee population significantly. The gradual decline of insect pollinators like bees is alarming since they have direct implications on our future agricultural productivity and also on the stability of fragile natural ecosystems. It is important to note that a large number of crops and wildflowers are exclusively dependent on natural (biological) pollinators like insects, snails and slugs, small birds (humming birds), and mammals (like bats) for pollination. Among all these insect pollinators, bees perform the most significant role in the natural cross pollination of a wide diversity of crops. Under these circumstances, it is absolutely necessary that we conserve our precious insect pollinators to secure the future of crop production and apiculture industries. It is time for us to develop a long term, comprehensive, cost effective, and sustainable conservation model to protect natural pollinators.

Small island nations are particularly vulnerable to Climate Change and Global Warming. Extensive research has been done around the globe suggesting that any negative natural or anthropogenic changes significantly impact the natural ecosystem and environment of island nation more drastically than any other places on this planet. Thus it is quite worrisome to know that such small island nations are extremely vulnerable to any kind of environmental manipulation whether natural or artificial. Hence it is important that comprehensive conservation policies are adopted in all major and minor island nation spread across our vast ocean systems in due time so that we are capable of protecting the unique ecosystem and rich biodiversity of this natural hotspots successfully. It is quite sad to note that several endemic species of flora and fauna have already become extinct in such unique island ecosystems spread across the planet. Thus we

need to take care today to secure the future of such small island nations in the future.

It is important to remember that most of the small island nations are based extensively on tourism and local agri-industries and cottage industries for their economic sustenance. The human populations living on such island nations under the current situations are extremely vulnerable with respect to both ecology and economy. Therefore it is important to design pollinator conservation policies in such small island nations in a coherent manner such that we can get ecology and economy to work hand-in-hand. Ecological conservation policies are to be developed together in such an integrated fashion of development that it sustains the small island local economy as well as the successful protection of their unique natural environment.

We have to remember that such highly endangered and susceptible pollinator insect populations that directly and indirectly impact three major industries of the region, namely: agriculture, forestry as well as apiculture. The loss of the highly vulnerable pollinator insects populations like honey bees, native bees, moths and butterflies in the region could have catastrophic impact on the stability of local ecosystems and dismantle the agri- and tourism based small economies. Ecology and economy needs to be integrated together in a coherent manner to secure the environmental as well as financial security of the entire Pacific island regions. We humbly urge all stakeholders in the region including the government and non-government organizations to join hands in building a multi-nation comprehensive pollinator insect conservation program across the entire oceanic island region.

We sincerely believe that together we could make significant impact in protecting both our involvement as well as the economy of the region. But the time is running out and we all need to act fast to prevent catastrophe hitting the region! It is therefore quite important that comprehensive conservation plans and strategies be developed immediately to protect the unique ecosystem of the Pacific island nations and the vulnerable pollinator insect populations. Under these circumstances, it is absolutely necessary that we conserve our precious insect pollinators to secure the future of crop production and apiculture industries. It is time for us to develop a long term, comprehensive, cost effective, and sustainable conservation model to protect natural insect pollinators.

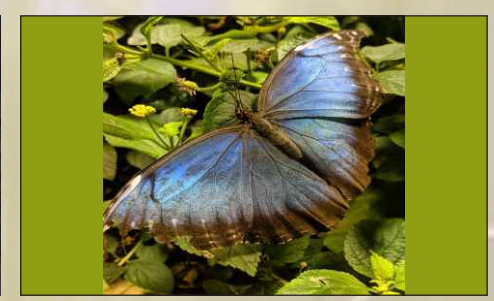
We propose the establishment of Pollinator Sanctuaries, Pollinator Gardens or Pollinator Habitats at suitable sites by using appropriate custom-designed Pollinator Mixes. Such Pollinator Mixes could include selected native wildflowers and grasses as well as pollinator friendly annual/biennial/perennial forage legumes and grasses in different proportions suitable for various agro-climatic zones. Plant species selected for the mix must be flowering in sequence, one after another, to extend the pollinator (bee) foraging period; and provide them with adequate supply of nectar and pollen. Pollinator Mixes need to be developed based on appropriate agronomic parameters of the target growing region based on local agro-climatic conditions; and keeping in mind the local pollinator diversity and their foliage preferences. Pollinator Mixes constituting of native wildflowers only, currently available commercially, are not a viable option due to their poor adaptability to local agronomic conditions, high yield fluctuations (based on locality and annual production variation), as well as high management and production cost. Integrated habitat Development (IHD) combining Pollinator Sanctuaries with inland fresh water bodies could help in multiple species conservation such as bees, birds and local fishes through carefully designed multiple species conservation strategies like Multiple Tier Conservation Model (MTCM). Small island pollinator conservation strategies could thus extensively benefit from Integrated Ecological Habitat Development for Bees, Birds and Fishes (IEHD-BBF) that can contribute towards multiple species conservation not just farer-friendly pollinator insects

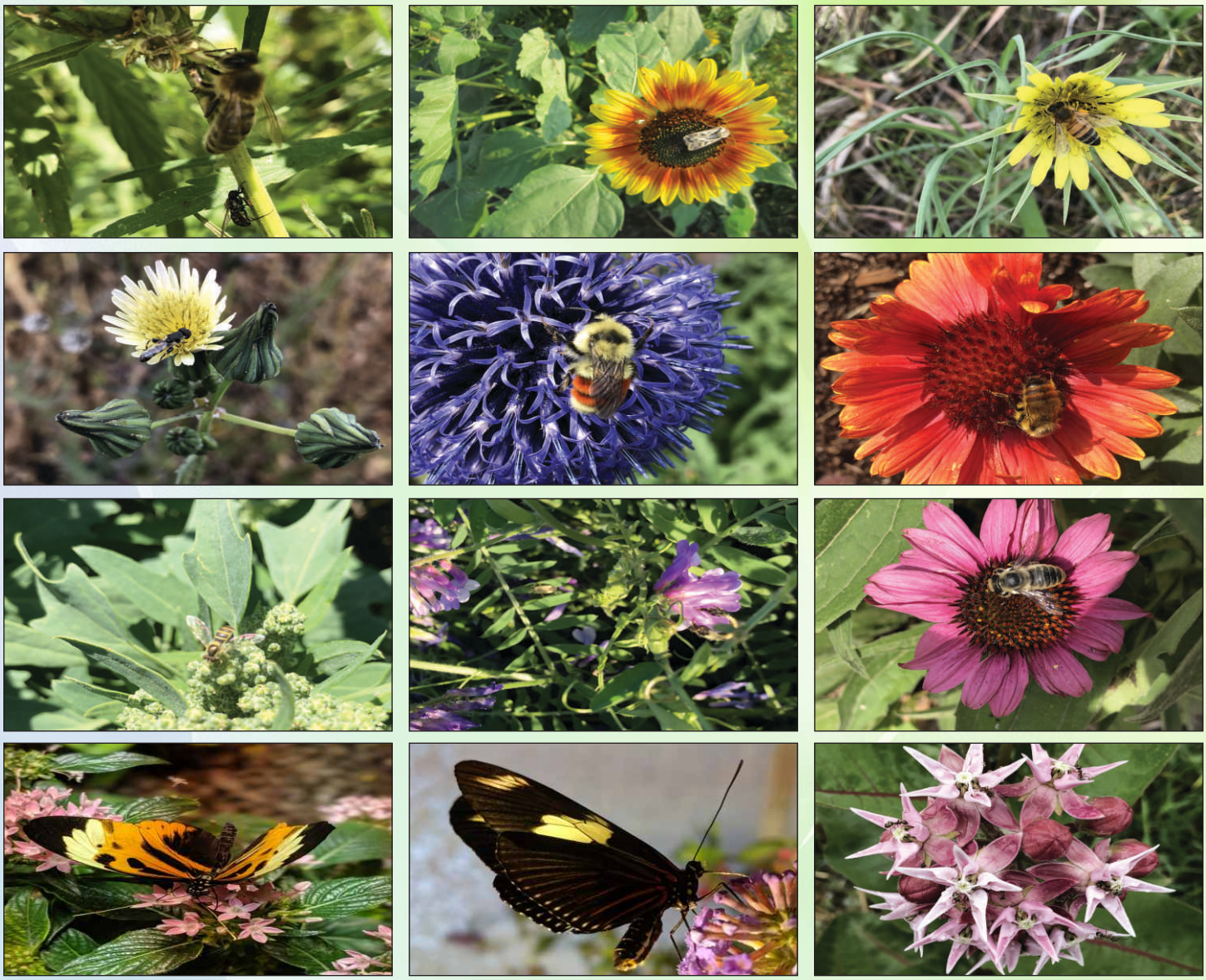
Suitable Pollinator Mixes could be used to create Pollinator Sanctuaries along farm perimeters, hard to access and unused areas of a farm, forest fringes, adjoining highways, boulevards and wetlands, city and municipal parks and gardens, golf courses, unused or agronomically unsuitable areas, remediation sites, and unused available sites in both rural and urban areas. Such Pollinator Mixes could include selected native (local or indigenous) wildflowers and grasses as well as pollinator friendly annual/biennial/perennial forage legumes and grasses in different proportions suitable for different ecological micro climate zones within the vast Pacific ecosystems. Development of suitable eco-friendly Pollinator Mixes for different Pacific agro-climatic regions can have both positive ecological and economic implications for the region and can pay a significant role in securing sustainable, low cost, low maintenance, successful pollinator conservation in the region.

Photo credit: S. K. Basu







RELIGIOUS ETHICS AND CULTURAL FESTIVALS: ROLES IN AGRO-BIODIVERSITY CONSERVATION IN INDIA

Namita Das Saha[1*] and Partha Saha[2]
[1*]Centre for Environment Science and Climate Resilient Agriculture (CESCRA), [2]Division of Vegetable Science, Indian Agricultural Research Institute (IARI), PUSA, New Delhi, India.
*Email: *soilnami@gmail.com*

India is very rich in terms of agrobiodiversity which encompasses a wide spectrum of habitats starting from tropical rainforests to alpine vegetation and from temperate forests to coastal wetlands. But these huge agrobiodiversity is presently being depleted by habitat destruction, fragmentation, over exploitation, climate change and many more. Agrobiodiversity conservation is of prime importance to maintain sustainability in agriculture. India is known as a famous land of celebrations, crowded ceremonies, fairs and festivals and other social activities. These religious ethics and festivals have a great role in agro biodiversity conservation directly or indirectly. Ingredients that make part of a festival or celebration are naturally protected because they serve a purpose and have ritual significance. Our ancestors had left various religious beliefs for us towards nature and it was a very constructive device for conservation of agro biodiversity not only during their time but at present also. Social taboos and cultural festivals represent good examples of informal institutions in biodiversity conservation. Hence this is the need of the hour to promote such traditional festivals along with other conservative incentives through local committment, supportive policies and official legislation for long-term sustainable conservation of traditional agrobiodiversity.

Keywords: Agrobiodiversity, Conservation, Religious ethics, Festival

Introduction

India is a god gifted country because it is very rich in agrobiodiversity. It is one of the most agrobiodiversity rich countries of the world with over 160 crop species with hundreds of varieties, 325 wild relatives of crop species and around 1500 wild but edible plant species and diverse domesticated diversity of animals and birds. Agrobiodiversity is the collective result of natural selection processes and the careful as well inventive selection by farmers and researchers over a longer period of time.

Agrobiodiversity is a vital sub-set of biodiversity. India is agriculture dependant country and here many peoples' food and livelihood security totally depends on the sustained management of various agrobiodiversity. Thus, agrobiodiversity encompasses the total variety and variability of animals, plants and microorganisms that are must for sustaining the key functions of any agroecosystem, including its structure and functions. Religious believe, local knowledge, ethics and cultures can therefore be considered as integral part of agrobiodiversity conservation.

Definition of Agrobiodiversity:
Agrobiodiversity can be defined as the variety and variability of animals, plants and microorganisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries. It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fiber, fuel and pharmaceuticals. It also includes the diversity of non-harvested species that support production (soil microorganisms, predators, pollinators) and those in the wider environment that support agroecosystems (agricultural, pastoral, forest and aquatic) as well as the diversity of the agro-ecosystems.

Agrobiodiversity: Few distinct features
i.Agrobiodiversity is managed by farmers (both male and female farmers).

ii.Many components of agrobiodiversity would not survive without this human interference; local knowledge and culture are integral parts of agrobiodiversity management.

iii.As human management is an integral part of agrobiodiversity conservation, thus preservation through establishing protected areas is very less relevant.

Threats to agrobiodiversity:

1. Habitat destruction:
Habitat loss or destruction is the primary cause of loss of agro biodiversity. Habitat loss resulted from large scale industrial activities, commercial activities associated with agriculture, irrigation, construction of dams, mining, fishing and many others.

2. Habitat fragmentation:
Habitat fragmentation is different from habitat destruction. Habitats are being fragmented into parts by roads, fields, canals, power lines, towns etc because of heavy demographic pressure. The dispersal and colonization of many species get restricted in isolated fragment of habitats. Apart from this, the habitat fragmentation also cause change in microclimatic conditions in terms of light, temperature, wind etc.

3. Pollution:
The most dangerous factor inducing loss of biodiversity is environmental pollution which includes air pollution, water pollution, industrial pollution, pollution due to chemical pesticides, radioactive materials etc.

4. Over-exploitation:
The natural resources are over exploited to meet growing demand by the ever increasing population, rural poverty, intensive technological growth and globalization of economy. All these factors together may be responsible for the extinction of a number of species.

5. Introduction of exotic and invasive species:
Many a time we introduce new exotic species in a particular area which sometimes overpower on the indigenous species and suppress their natural population.

contd. in next issue Feb. 2020

To,

Vol. 23 Issue - 01 (Monthly) January 2020

From
NATIONAL ENVIRONMENTAL SCIENCE ACADEMY
206 Raj Tower -1, Alaknanda Community Centre,
New Delhi -110019. **Ph.: 011-2602 3614**
E-mails: nesapublications@gmail.com; nesapub@yahoo.co.in

I CAN .. CAN YOU?

Rechargeable batteries instead of disposables

Durable instead of disposables

Plastic, avoid it as much as you can

Donate old furniture and clothes instead of throwing them away

Plants. Put a beautiful potted plant in you balcony

APPEAL TO LIFE MEMBERS

NESA Life Members are requested to submit short articles for the NESA e-Newsletter that are consistent with NESA's objectives to improve environment. The articles should focus on topics related to environment and facilitate communication and discussion among researchers, academicians and students. The articles for December edition can be submitted to nesapublications@gmail.com before 25th February, 2020.

Dr. R.S. Tomar, Editor, NESA E-newsletter