

ONLY NEWS PAPER PUBLISHED IN INDIA FOR SCIENTIFIC COMMUNITIES

NESA NEWSLETTER

NATIONAL ENVIRONMENTAL SCIENCE ACADEMY

Vol. 24 Issue - 8 (MONTHLY)

August 2021

From the Editor's

Dear Readers,

Greetings!!

In August issue, we recount the articles involving work and ideas of authors from diverse field to recount the status on various activities. Medicinal plant exhibition and training was organised by College of Horticulture and Forestry, RLBCAU, Jhansi in the month of August. This issue also includes Annual awards by Academy for its members actively involved in their field or events and activities organised by the Academy. NESA is well known for its environmental awareness activities.

I express my sincere and huge thank to all the persons who contributed writing the wonderful and inspiring articles, without which there wouldn't have been this newsletter issue. Please continue sending articles to publish and share with your friends also. I would like to thank President and General Secretary, NESA, New Delhi, and the Editorial team including Print, Designer and Publication committee for their nonstop support and efforts throughout this edition.

We hope this edition makes an interesting read. Please feel free to offer any suggestions for improvement.

Dr. Sushma Tiwari

Associate Editor

Dr. R. S. Tomar

Editor-in-Chief

Editorial Board Members

Dr. S.K. Basu

PS, Lethbridge AB Canada

E-mail: saikat.basu@alumni.uleth.ca**Dr Syed Shabih Hassan**

Scientist (Fisheries) & NSS Programme Officer, Department of Fisheries Resource Management, College of Fisheries, GADV & AS University, Ludhiana

E-mail: fish_ab@rediffmail.com**Dr. Deeksha Dave**

Assistant Professor (Environmental Studies), School of Inter Disciplinary and Trans Disciplinary Studies, IGNOU, New Delhi

E-mail: deekshadave@ignou.ac.in**Dr. Ashok K. Dhakad**

Scientist (Tree Breeding), Dept. of Forestry & Natural Resources Punjab Agricultural University, Ludhiana, Punjab

E-mail: ashokdbakad@pau.edu**Dr. Prabha Singh**

Scientist, ICAR-IGFRI, Jhansi, Uttar Pradesh, India

E-mail: prabbabbadauriya72@gmail.com**Dr. Pavan Kuma**

Assistant Professor, College of Horticulture and Forestry Rani Lakshmi Bai Central Agricultural University, Jhansi, India

E-mail: pawan2607@gmail.com

PLANTATION DRIVE 2021 JOINTLY BY JAMIA HAMDARD & NESA



The plantation drive was organised jointly by Jamia Hamdard and NESA on 15th August, 2021 at the herbal garden, Jamia Hamdard. The inauguration of plantation drive was done by Prof. Dr. Afshar Alam, Vice Chancellor, Jamia Hamdard. The function was organised with the support from the dept. of Horticulture, Jamia Hamdard on the occasion of 75th Independence Day. The other guests and faculty members & students were present on this occasion. The Registrar Dr. S.S. Akhtar was also present on this occasion. Prof. M.Z. Abdin, Chairman, Environment Quality Cell & Horticulture Committee organized the programme as Co-ordinator, Prof. Sarwar Alam, Proctor of the university also graced the occasion with other faculty members. Mr. Mirza Rahil Beg was also present and designed the banner and prepared the report for the University website.

The horticulture staff and N.S.S. Cadets took active part in the plantation drive. Mr. Azhar Khan, Executive Engineer was also present at the venue. P.R.O. of the University arranged the





photography. Dr. Iqbal and Dr. Mohd. Salik from the Dept. of Botany were responsible for providing saplings of *Saraca asoka* for the inaugural ceremony of the plantation drive. The Estate Officer Mr. Furqan Ahmad arranged the big banner at the front gate of the herbal garden. The sowing beds in the Herbal Garden were properly maintained by the gardeners of Horticulture Dept. they were decorated with their name plates.

The administration and staff of NESA also provided saplings of tree (25 Nos.) for plantation drive. 225 plant saplings were also procured free of cost from the Govt. Nursery, Tughlakabad, near Shooting Range, New Delhi. Four plants of *Saraca asoka* were provided by the Horticulture Department, Jamia Hamdard for ceremony.

Opening remarks were given by Prof. Javed Ahmad, President, NESA at the time of inaugural ceremony. He pointed out that India is among the current big emitters of Green House Gases (*i.e.* U.S., China, EU & UK, India, Russia & Japan). He mentioned about major Biosphere crisis. As there are only 28 trees per person in India. Global average is 422/per person. Canada is at the top of the list as there are 8,953 trees/per person. Brazil and Russia are also having sufficient trees per person in their respective countries.

President, NESA emphasized on Mass Plantation in educational institutions, like in U.S.A., Canada, Europe and Japan. He said that this practice should be replicated in India. He further suggested that subject of Environmental Studies to be made with practical. Newly admitted students of U.G., P.G. & Ph.D. students

to be made compulsory to plant trees in their own localities too. In their absence, the parents will bear responsibility of taking care of the saplings. The students will be required to submit GPS data along with the passport & picture of plantation site. The university may consider geo-tagging of the trees. He further suggested for creating facilitation centre in the Herbal Garden, Jamia Hamdard. It will focus native species and the local persons may be benefitted & may get experience of plantation practices. The University may also arrange the workshop to educate local farmers in the coming winter.

He further explained that plantation has its own advantages. It reduces air pollutions and maintains the temperature of the atmosphere. Propagation of rare plants of medicinal value should be given priority in the Herbal Garden. Nursery of Indoor plants may be developed here. It is a good solution to curb down indoor air pollutants.

The top ten Indian plants for removing formaldehyde, benzene, and carbon monoxide from the air should be propagated in the Herbal Gardens.

Mrs. Hena Parveen also planted tree of *Saraca asoka* at this occasion. All the faculty members, students and staff took active participation in the plantation drive.

The Chief guest also delivered his remarks on plantation drive. Vote of thanks was given by Prof. M.Z. Abdin. The drive was continued upto 5 p.m. on 15th August, 2021.

VANMAHOTSA FUNCTION IN ALFALAH UNIVERSITY, FARIDABAD,

The President, NESA visited Alfalah University on 9 th August and during my stay in week the Plantation drive program was organised in Alfalah University campus . Plantation drive was organised in front of Administration Block , in girls hostel and residential block on 10 th August at 11.30 am in presence of faculty members and Registrar Prof Dr Shahjahan Saheba and horticultural staff.

The Araucaria plant sapling was planted before the Administrative Block. Registrar also planted tree saplings of Bottle Palm in the girls hostel.

Dr TK Saha, Dr Dubey, Dr Misra, Dr S. Khursheed Dr Parvez participated in the inaugural ceremony of Plantation drive.

Prof Javed Ahmad, Member, Academic Council & President NESA was welcomed by the Registrar as a Chief guest of Vanmahotsa Function in Alfalah University.

Dr Fardeen , faculty member and I/ C Horticulture department made all necessary arrangements for the drive. The trees saplings were also purchased from local nursery for the plantation drive with in the campus .

Bottle Palm, Fishtail Palm, Araucaria, Polyalthia longifolia, Silver Oak, Lagerstromia, Pongamia were planted in the campus.



A VISIT TO DELHI UNIVERSITY

President NESA, Prof. Javed Ahmad visited Department of Botany, University of Delhi on 19th August 2021 to meet Prof. Dinabandu Sahoo and congratulated him for his new assignment as Director of Himalayan Studies and Innovation Institute.

We also visited Dr. Baram Paani, Dean, College of University of Delhi and presented him NESA Honorary Award for the year 2020. Discussions also held for the collaboration of NESA with the Colleges of University of Delhi and some environmental awareness activities along with the University of Delhi i.e. air pollution, burning of rubber tyres, e-waste, solid waste, one time plastic use & water conservation & maintenance of heritage trees of Delhi.

Prof. Dinabandhu Sahoo gave us a round on the campus of the Institute of Himalayan Studies for holding some lecture series with the collaboration of Himalayan studies.

Prof. Dinabandu Sahoo also showed us the herbal garden of the University of Delhi and told us about the plantation drive in the University of Delhi on 15th August, 2021 by the honorable Vice Chancellor, Finance Office, Registrar, Faculty Members as well as students.

After the visit of the herbal garden President, NESA Prof. Javed Ahmad thanked Prof. Dinabandhu Sahoo with bouquet and invited him for collaboration with NESA.



TRAINING, EXHIBITION AND DISTRIBUTION OF MEDICINAL & AROMATIC PLANTS AT RANI LAKSHMI BAI CENTRAL AGRICULTURAL UNIVERSITY, JHANSI

RS Tomar, Vinod Kumar, Pankaj Lavanya Gaurav Sharma and AK Pandey*

*Corresponding author: pandey.ajai1@gmail.com



A 03 day programme of Training, Exhibition and Distribution of Medicinal & Aromatic Plants w.e.f. 12-14th August, 2021 was organized by College of Horticulture and Forestry, Rani

Lakshmi Bai Central Agricultural University, Jhansi. **Shri Jogender Kumar**, DIG, Jhansi was the Chief Guest of the inaugural programme and **Prof. Arvind Kumar**, Hon'ble Vice Chancellor, RLBCAU, Jhansi delivered his presidential address. **Dr. A. Arunchalam**, Director, ICAR-CAFRI, Jhansi; **Dr. Surendra Singh**, Joint Director Agriculture and **Dr. Anand Choubey**, Jt. Director, State Family Welfare and Health Department graced the occasion as Guest of honour in the programme. **Dr. A. K. Pandey**, Dean, College of Horticulture & Forestry, RLBCAU, Jhansi while welcoming the Chief Guest and other dignitaries on the occasion, highlighted the importance of Ayurvedic medicines during pandemic period of COVID-19. He informed that the Ministry of Ayush recommends several self-care guidelines for preventive health measures and boosting immunity with special reference to respiratory health. These are supported by Ayurvedic literature and scientific publications. Rich biodiversity associated with traditional knowledge of India has given its own recognition as one of the mega-diverse countries. Every day the demand for useful and herbal plants is increasing. The knowledge as well as production of these plants is the need of the hour. Importance of medicinal plants like *Tulsi*, *Giloy* and *Ashwagandha* is well known in the world and several researchers are rigorously working to utilize the end products. Lemon grass is one which gives fragrance and widely used for extracting oil and aroma. This oil is widely used to treat digestive problems and high blood pressure. It is a popular ingredient in aromatherapy to help relieve stress, anxiety, and depression. Lemon grass can easily be planted on the farm boundary. Lemon grass oil with phenyl is used as disinfectant for the general cleaning of floors, toilets, drains etc. Dr. Pandey said that growing of kitchen garden was very familiar from earlier days but nowadays medicinal plants need to be planted with the concept of Ayurvedic garden in every home.

Dr. A. Arunachalam, Director, ICAR-CAFRI congratulated the organizers for organizing the three days Training and Exhibition of Medicinal & Aromatic Plants to local farmers and villagers. He said that locals and farmers living nearby to the University will be

benefitted most with such programs organized by the University. Apart from cultivation of Medicinal plants at domestic level, there is need to grow at large and commercial scale so that commercialization of the product can be achieved.

Dr. Anand Choubey, Jt.

Director, State Family Welfare and Health Department, Jhansi in his speech narrated the importance of Ayurved from the ancient times when the term *Sanjeevani* was introduced in Ramayan to save the life



of Lakshman. Occasionally people debate about efficacy of Allopath and Ayurved. He stated the importance of Ayurved by saying that if we need a stable and long term treatment of any disease without any side effects in that case there is no option of Ayurved. It is the traditional drug of Indians. It was there in the past, available in the present and will continue in future also. It was a major source of medicine and immune strength in the Corona period. With the use of highly scientific level research and guidelines, it can be used at larger scale and in many applications. He felt the need of planting of Medicine plants and herbs in hospital premises to make the people aware.



Dr. Surendra Singh, Joint Director Agriculture, Jhansi stated the importance of cultivation of herbal and medicinal plants in the region. Dr. Singh said that

soil and climatic conditions of Bundelkhand region is highly suitable for cultivation of these medicinal plants. He congratulated the organizers and suggested the farmers to take advantage of such training programs.

Shri S. Sarvariya, Production Manager **Baidyanath**, congratulated the organizers for conducting such a great event of training and exhibition to locals and farmers. He assured that in future Baidyanath Industries will consume all the raw materials produced by the farmers in the region.

Chief Guest Shri Yogendra Kumar, Deputy Inspector General of Police (DIG), Jhansi while inaugurating the exhibition, discussed about the importance of medicinal and aromatic plants in day to day life. He said that cultivation of medicinal and aromatic plants is very useful in Bundelkhand region. Ayurveda's extensive knowledge is based





on preventive care and it is a plant-based science. There is tremendous knowledge of Ayurvedic medicines in our countrymen but it need to be

explored and shared among others. Inviting the attention of growers, Shri Kumar said farmers are always welcome to take the information and cultivation tips from the skilled staff of University. Further, he emphasized with the initiatives of Indian Government in promoting tree-based farming for maximizing farm returns and providing sustainable livelihood to farmers and to encourage tree plantation on farm land "HarMedh Par Ped", along with crops/cropping system.

Prof. Arvind Kumar, Honourable Vice Chancellor, Rani Lakshmi Bai Central Agricultural University, Jhansi thanked all the organizers and the farmers who showed keen interest in attending three days training and exhibition conducted by University. He gave the importance of Ayurved in everyone's life. He also narrated the Indian Government plan to grow more number of plants. He elaborated the importance of *Aloe vera* juice and said that its juice extraction process is very simple and its mass scale cultivation can be popularized in the Bundelkhand Region. He also shared the information about Massive Plantation Drive conducted by RLBCAU, in the boundary region where several hundreds of *Neem (Azadirachta indica)* trees were planted. Inviting the attention of

participants for opting more medicinal plants in daily routine towards boosting the immunity, Hon'ble Vice Chancellor advocated the use of herbal tea which comprises of *Ginger*



(*Zingiber officinale*) and Muleti (*Glycyrrhiza glabra*). While concluding his speech, he assured the growers that university will continuously help the farmers to grow the best plants provided by the university nursery in near future.

Dr. Gaurav Sharma, HOD (Horticulture), gave vote of thanks to all the dignitaries who graced the occasion. Dr. Sharma expressed his gratitude to all the farmers who came to participate from different nook and corners of the district. He also thanked all the members of different committees viz., Dr. Arjun Kumar Ola, Dr. Ghan Shyam Abrol, Dr. Ranjit Pal, Dr. Pavan Kumar, Dr. Priyanka Sharma, Dr. Prabhat Tiwari, Dr. Rakesh Kumar Negi, Dr. Maneesh Pandey, Dr. Govind Vishwakarma, Dr. Garima Gupta, Dr. Pavithra, Dr. J.A. Bhatt, Dr. A. Kale, Dr. Deepika Ayate, Dr. Swati Shedage, Dr. Y. Bijilaxmi, Dr. Umesh Pnkaj, Dr. Ashutosh Singh, Dr. Tanuj Misra, Dr. Shailendra Kumar and Mr. Devesh Tiwari who contributed to make the event most successful. He specially thanked to Dr. Alka Jain for nicely conducting the programme of inaugural ceremony.



ANTIBIOTICS, SCIENCE BEHIND ANTIBIOTIC RESISTANCE, ITS DEVELOPMENT AND IMPACT

Syed Shabih Hassan

Joint Secretary, National Environmental Science Academy, New Delhi

Corresponding author: hassan03048@gmail.com

Antibiotics

Any substance that inhibits the growth and replication of a bacterium or kills it outright can be called an antibiotic. Antibiotics are a type of antimicrobial designed to target bacterial infections within (or on) the body. This makes antibiotics subtly different from the other main kinds of antimicrobials widely used today:

Antiseptics are used to sterilize surfaces of living tissue when the risk of infection is high, such as during surgery.

Disinfectants are non-selective antimicrobials, killing a wide range of micro-organisms including bacteria. They are used on non-living surfaces, for example in hospitals.

Of course, bacteria are not the only microbes that can be harmful to us. Fungi and viruses can also be a danger to humans, and they are targeted by antifungals and antivirals, respectively. Only substances that target bacteria are called antibiotics. Most antibiotics produced in laboratories, but they are based on natural compounds. Some microbes, for example, produce substances to kill other nearby bacteria in order to gain an advantage when competing for food, water or other limited resources. However, some microbes only produce antibiotics in laboratory.

Antibiotic preparations

Antibiotic preparations come in many different forms, depending on where the infection they are targeting is located. Creams or ointments may be applied to infections on the outside of the body, while pills or liquids are used for most infections inside the body. Here, antibiotics are absorbed into the bloodstream or target bacteria in the digestive tract itself. Injections of antibiotics directly into the bloodstream are only used for the most serious infections.

Antibiotic: A class of drugs used to treat bacterial infections.

Antibacterial: Used to be a synonym for antibiotics. Today, substances used to disinfect non-living surfaces are also known as antibacterial.

Antifungal: A class of drugs used to treat fungal infections.

Antiviral: A class of drugs used to treat viral infections.

Antimicrobial: Term used for antibiotics, antibacterial, antifungal, and antiviral substance

Why are antibiotic important?

The introduction of antibiotics into medicine revolutionized the way infectious diseases were treated. Between 1945 and 1972, average human life expectancy jumped by eight years, with antibiotics used to treat infections that were previously likely to kill patients. Today, antibiotics are one of the most common classes of drugs used in medicine and make possible many of the complex surgeries that have become routine around the world.

The public health revolution that antibiotics brought about was not without its cost. The more we use them, the more resistant bacteria become. With antibiotic resistance on the rise, increasing numbers of people die every year of infections caused by bacteria that have become resistant to the antibiotics previously used to treat them. It is estimated that, by 2050, the global cumulative cost of antibiotic resistance will reach 100 trillion USD.

In the 1950s and 1960s new drugs were being isolated all the time. However, the rate of drug discovery has slowed markedly. This lack of effective new antibiotics means that drugs previously set aside as “reserve” antibiotics, meant to be used only when no other treatment is available, are being used more and more regularly and resistance is developing to them, too.

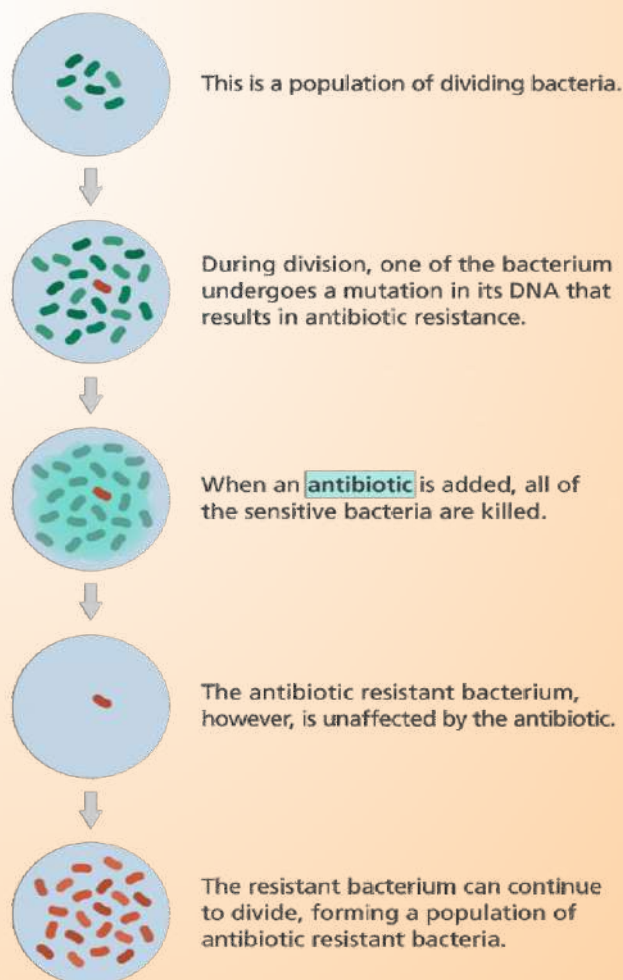


Fig. 1: Diagram showing how a population of bacteria can develop resistance to an antibiotics.

Examples of methods of antibiotic resistance

Method of resistance	Antibiotic
Reduced uptake into cell	Chloramphenicol
Active efflux from the cell	Tetracycline
Eliminated or reduced binding lincomycin of antibiotic to cell target	β -Lactams, erythromycin,
Enzymatic cleavage or modification to inactivate antibiotic molecule	β -Lactams, aminoglycosides, chloramphenicol
Metabolic bypass of inhibited reaction	Sulfonamides, trimethoprim
Overproduction of antibiotic target	Sulfonamides, trimethoprim

If we ran out of effective antibiotics, modern medicine would be set back by decades. Relatively minor surgeries, such as appendectomies, could become life threatening, as they were before antibiotics became widely available. Antibiotics are sometimes used in a limited numbers of patients before surgery to ensure that patients do not contract any infections from bacteria entering open cuts.

How do antibiotic works?

Antibiotics are used to treat bacterial infections. Some are highly specialized and are only effective against certain bacteria. Others, known as broad-spectrum antibiotics, attack a wide range of bacteria, including ones that are beneficial to us. There are two main ways in which antibiotics target bacteria. They either prevent the reproduction of bacteria, or they kill the bacteria, for example by stopping the mechanism responsible for building their cell walls.

How does antibiotic resistance develop?

Antibiotic resistance is a serious and growing problem in modern medicine. The overuse of antibiotics in recent years has played a major role in increasing the prevalence of antibiotic resistant bacteria. Bacteria are quick to evolve resistance to antibiotics. This can occur through spontaneous mutations, the result of mistakes when bacteria copy their DNA as they divide. Mutations that allow bacteria to survive where others do not are beneficial and are passed on to successive generations; antibiotic resistance is a prime example. Bacteria can also develop resistance by taking up genetic material containing antibiotic resistance genes from their surroundings.

Antibiotic resistance occurs due to changes, or mutations, in the DNA of the bacteria, or the acquisition of antibiotic resistance genes? from other bacterial species through horizontal gene transfer. These changes enable the bacteria to survive the effects of antibiotics designed to kill them. This means that when an antibiotic is used, all the bacteria that have not undergone a mutation are killed, while the antibiotic resistant bacteria remain unaffected. The antibiotic resistant bacteria are able to continue to divide

and grow producing even more bacteria that are not affected by the antibiotic (Fig.1).The existence of resistant strains of bacteria means that antibiotics or drugs designed to kill them no longer work, allowing them to spread rapidly, posing a risk to public health. When this happens, it is necessary for the researcher to develop new antibiotics that the bacteria do not have resistance to.

Antibiotic resistance often arises when an antibiotic wipes out all susceptible bacteria – resistant ones survive and pass. Spontaneous mutations in bacterial DNA are also common. Mutations can confer antibiotic resistance in several ways.

Science behind antibiotic resistance:

How does resistance get passed on?

Antibiotic resistance is encoded in the DNA of bacteria, on one or more genes. For example, a gene may control whether the bacterium produces a chemical that destroys antibiotic molecules. Plasmids, circular chunks of bacterial DNA that exist naturally inside many bacterial cells, may contain genes that confer antibiotic resistance. In addition to reproduction, plasmids can move between individual bacterial cells in several different ways:

- When two bacteria are near each other, genetic material can be passed directly between cells, or via a hollow structure called a pilus, or a pore, that can form between the two cells. Plasmids can use this pilus like a bridge, sending copies of themselves from one cell to the other. DNA sequences that can move from one location on a genome to another (known as transposons) can pass through the pore from one cell to another (this process is known as conjugation).
- Transformation of genetic material occurs when a bacterium dies, at which point it breaks up and releases its DNA into its environment. Nearby bacteria can pick up bits of this free-floating DNA and integrate it into their own genomes, creating a potential pathway for antibiotic resistance dissemination.
- Transduction occurs when a virus attacks a bacterium and takes over the cell to make copies of itself. Sometimes, bits of bacterial DNA are included in the DNA of the virus particles produced. The viruses then carry these chunks of bacterial DNA to other bacteria they infect.

To reduce antibiotic resistance, it is important that patients finish a course of antibiotics once they have started it. This is the only way to ensure that as many bacteria as possible that are causing the infection are wiped out so that none are left to start a resistant bacterial population.

Measure to slow antibiotic resistance

Antibiotic resistance develops naturally. It often evolves spontaneously and can play a role in competition between microbial species, and as a result we cannot – and do not want to – stop it completely. Much rather, the aim is to slow its advance to ensure that antibiotics remain useful and effective for as long as possible. There are several aspects to this challenge, which are summarized under the umbrella term “antibiotic stewardship”.

Alternatives of Antibiotics

Scientists have speculated what we could do if worst came to worst and we had to make do without any antibiotics. Researchers are exploring other possibilities, bacteriophages and phage therapy. Bacteriophages are viruses that infect bacteria – their name translates as “bacteria eaters”. Some scientists used bacteriophages to treat many infections.

Concerns on the use of antimicrobials:

Abuse, overuse, and misuse:

Antibiotics should only be used in a confirmed bacterial infection case; not for viral infection; thus, based on correct diagnosis. Only antimicrobials labelled to treat the condition diagnosed and licensed for use of the species affected should be used. Such drugs should also be properly handled (and disposed), stored and expiry dates should be closely monitored; and they should be administered by a recognized and/or licensed aquatic animal health professional.

Human and animal health issues:

Animal health issue is treatment failure due to increase in

resistance. Human health issue is adverse health effects associated with the presence of residues in the food produced or resistance in bacteria associated with human disease. Resistance in bacteria causing human disease may arise either directly via enrichment of these bacteria in the aquaculture environment or indirectly via enrichment of the genes that encode such resistance and which may subsequently be transferred to bacteria associated with human disease.

Environment and ecological issues:

These include release of the medicines into the aquatic environment through leaching from unconsumed feeds, intentional or unintentional release of effluent water from aquaculture facilities and presence of residues in faecal materials. The impacts on local ecosystem are, in general, poorly studied. The ecological concerns include accumulation of residues in the sediments, impacts of drugs and chemicals on natural biota, and possible development of antimicrobial resistance in aquatic bacteria.

Antimicrobial resistance genes:

Antimicrobial resistance genes (ARGs) may have evolved

BIOTECHNOLOGICAL APPROACH FOR THE PRODUCTION OF RED BANANA

Nisha Thakur¹, Amarjit K Nath²,
Pooja Sharma² & Deepika Negi²

¹Department of Agricultural Biotechnology
CSKHPKV, Palampur HP 176061

²Department of Biotechnology
Dr YS Parmar UHF, Nauni, Solan HP 173230
Corresponding author : nathamarjit60@gmail.com

INTRODUCTION

Nature has provided a variety of food resources to fulfil the hunger of its inhabitants. The cereal crops have gained priority among others food crops. The fruits can't be abandoned due to their nutritional importance. A varieties of fruit crops are utilized by people of different geographical regions depending upon their availability. Red banana – the most acquainted fruit crop in tropical and subtropical regions is the triploid cultivar of wild banana with red skin, it grows naturally in Southeast Asian parts of the world. Various varieties of red banana grow in different regions of India and are known by their traditional names. In Jalgaon district of Maharashtra, about 50 % of the district grows banana crops and is widely known as “Banana City of India”. In Southern parts of India, Kamalapur Red Banana is an outstanding variety of red banana grown in Kamalapur village in Telangana and is frequently called as "rich man's fruit" in that area (Pyati, 2010). The Kamalapur Red Banana got registered under the 'Geographical Indication (GI) registration due to its unique identity. Similarly, In district Thiruvananthapuram, a highly prized variety of red banana locally known as kappa pazham grows and has its

own cheerleaders in Thiruvananthapuram , who rave about their favourite variety of plantain and consider it as VIP fruit due to its eye catching colour and creamy flavour.

The red banana fruit plants requires an optimum temperature ranging from 13°C – 38°C for their growth (Simmonds, 1966). It is botanically classified as cultivar 'Red Dacca' belonging to genus *Musa* species *acuminata* and the cultivar group AAA. Morphologically red banana plants are tall with non-woody stems having a purplish appearance. It has a coloured look and it also used as an ornamental plant (Fig.1). Red banana fruits have deep red / maroon rind due to presence of beta carotene. Red coloured variety of banana is preferred over yellow ones because they are nutritionally more enriched with phenolics, anthocyanins, iron as well as beta-carotene contents as compared to yellow bananas (Adedayo et al., 2016). On daily basis, red bananas provide approx. 23% of the potassium required for proper working of muscles.



Fig. 1: *Musa acuminata* plant in natural conditions.

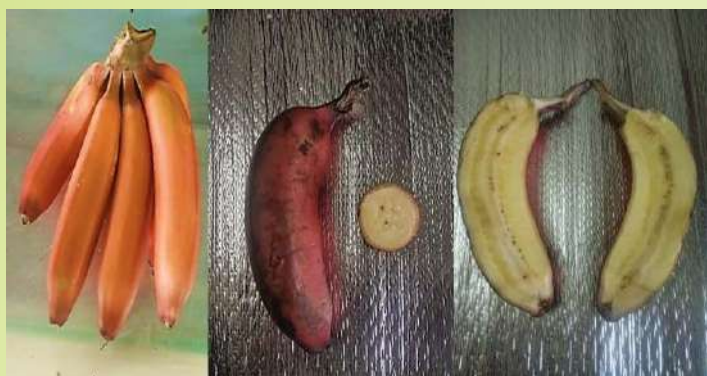


Fig 2: Red banana.

According to Central Food Technological Research Institute (CFTRI) report, red bananas are more enriched with Vitamin A, B6, C, and D than other bananas. Morphologically, these are smaller in size having mild sweetness as compared to yellow ones. Studies have indicated that the red bananas have low GI (glycaemic index) with a GI score of 45 as compared to the yellow bananas having a GI score of 51. This is beneficial for the reduction of an instant spikes of blood glucose levels in the body, which helps in control diabetes (Kalergis *et al.*, 2005). All parts of red banana plants have medicinal properties. Traditionally, red banana flowerblossoms are used to treat dysentery, ulcers, and bronchitis and cooked flowers are considered a good food for diabetics. The sap, and roots are used for digestive disorders. The peel and pulp of its fruits have antifungal and antibiotic components. The red bananas have higher fibre and are rich in antioxidants as compared to their yellow lineages (Fu *et al.*, 2018).

Red bananas (*Musa acuminata*) are seedless like the yellow ones and hence it can be propagated vegetatively through suckers, but at a very low rate of 5–10 suckers per plant per year (Vuylsteke and Oritz, 1996). Also, there are production losses due to the transmission of soil-borne diseases through rhizomes as well as some viral infections (Javaria, 2015). Keeping these limitations in the mind, biotechnological approaches *viz.*, micropropagation is commonly carried out for the production of elite banana varieties. Preliminary in *Musa acuminata* (AAA) cv. Vaibalhla (a cultivar of Mizoram), micropropagation has been done by tissue culture (Hrahse *et al.*, 2014). Using this technique, disease-free clones with high production rates can be produced throughout the year independent of seasons (Keskar *et al.*, 2019). Also, a greater number of roots are present in micro-propagated banana plantlets as compared to the ones propagated through conventional methods (Anbazhagan *et al.*, 2014). In the tissue-cultured laboratories, micro-propagated seedlings are raised *in vitro* which are, therefore pests and disease-free, having uniform growth patterns. In the laboratory, there is continuous multiplication of plant parts, so the seedlings are available all around the year, irrespective of seasonal variations (Rahman *et al.*, 2013). These are then hardened and transferred to the fields for planting. The tissue cultured produced banana plants have uniform size, true to type and their fruit bunches are of higher quality. Stages of micropropagation of red banana are the same as yellow banana micro propagation. However, *invitro* conditions *viz.*, culture medium, hormones concentration, temperature variation, etc. must be standardized (Rajoriya, 2011). Generally, the micro propagation protocol involves the following steps:

1. Initiation stage : Any part of a plant (explant) having meristematic cells such as stem tip, axillary bud tip and root tip are selected from the desired plant. Sterilization of the explant can be done by using chemicals *viz.*, sodium hypochlorite, cefotaxime, carbendazim, tween-20 and ethanol under standard conditions. After sterilization, the explants are cultured on the artificial MS medium (Murashige and Skoog) for their further multiplication.

2. Multiplication stage: Different concentrations of growth regulators *viz.*, BAP (5-8 mg/l), NAA (1-3mg/l) must be supplemented to the MS basal media to standardize a concentration suitable for 70% -90% of multiplication response with a maximum no of shoots per culture. **3. Rooting stage:** Rooting hormone IBA, concentrations ranging from 0.5-2.0mg/l is supplemented in the culture medium for root proliferation from micro shoots. Generally, a concentration of 1.0 mg/l IBA has been found best for root initiation in banana microshoots (Rahman *et al.*, 2013).

4. Hardening and acclimatization: Well-rooted plantlets should be selected and transferred to primary hardening combinations of cocopeat: soil (3:1) and for secondary hardening they are transferred to poly bags containing ground soil: cow dung (1:1).



Fig. 3: Hardened micro propagated banana plantlets.

References

1. Adedayo, B C., Oboh, G, Oyeleye S. I. and Olasehinde, T.A. (2016). Antioxidant and antihyperglycemic properties of three banana cultivars (*Musa* spp.). *Scientifica*: 1-7
2. Anbazhagan, M., Balachandran, B. and Arumugam, K. 2014. *In vitro* propagation of *Musa* sp (Red Banana). *Int. J. Cur. Microbio. App. Sci* 3(7):399-404
3. Fu X, Cheng S, Liao Y, Huang B, Du B, Zeng W, Jiang Y, Duan X, Yang Z. (2018). Comparative analysis of pigments in red and yellow banana fruit. *Food Chemistry* 239:1009-1018
4. Hrahse, L., Basu, A., Sahoo, L. and Robert, T. (2014). *In vitro* propagation and assessment of the genetic fidelity of *Musa acuminata* (AAA) cv. Vaibalhla derived from immature male flowers. *App. Biochem. and Biotech.* 172(3):1530-1539.
5. Javaria Qazi (2015). Banana bunchy top virus and bunchy top disease. *J General Plant Pathol* 82 (1): 2—11

हर घर में पेड़ लगे और हरियाली चारों ओर हो।

BAMBOO: A SUBSTITUTE FOR WOOD AND WOOD-BASED INDUSTRIES

Pawan Kumar Poonia^{1,2*}, Vinayak Upadhy², Hanumantha M², Manjunatha GO² and Sushil Kumari¹

¹Department of Forestry, College of Agriculture, CCS HAU Hisar, Haryana, India-125004

²Department of Forest Products and Utilization, College of Forestry (University of Agricultural Sciences, Dharwad), Sirsi, Karnataka, India- 581401

Corresponding author: pooniaforestry@gmail.com

Introduction

Wood is widely used in different applications such as building, tools, weapons, furniture and transportation. This dependency on wood increased with time. It still holds a prime position as industrial and consumer raw material. Increased prices of raw materials for wood-based industries, sustainability of natural reservoirs and threat to the environment due to extensive use of wood have forced to use natural redeemable materials for the development and fabrication of wood-based products. Bamboo is one such alternate source and substitute for wood. Similar to wood bamboo is also a green building material, which is environmentally friendly and follow sustainable development strategies. It is an inexpensive and fast-growing resource with favourable physical and mechanical properties comparable to some common wood species (Ukey *et al.* 2019; Sihag *et al.* 2017). It takes only 3 to 5 years of period from plantation to processing, compared to 30 to 50 years of most of tree species in the tropics and subtropics. Hence, it is perceived as one of the most important Non-Timber Forest Product (NTFP) in the world. Bamboo is multipurpose genus used for building construction, furniture, panel products, handicraft etc. It was recognized as a potentially important source of cultural and environmental services. Over the last 3 decades, bamboo has evolved simply being a raw material for basic goods into a material base of an increasingly diversified array of products. Bamboo industry plays a significant role in the economy and society development worldwide.

India is the second-largest country in the world having approximately 40% of the total bamboo forest area after China. In recent years, the bamboo industry developed rapidly due to the increased awareness and demand about sustainable consumption and inadequate supply timber resources in India. Using natural bamboo as raw material, a series of new products, viz., bamboo mat, plywood, bamboo-woven plywood, and laminated bamboo lumber (LBL), oriented strand lumber (OSL), inorganic-bonded board (i.e., cement), wood plastic composites (WPC) are produced. Bamboo products gained market demand because of its fast growing nature, high productivity, quick maturity and high strength with an advance in processing technology.

The public and private sectors need collaborative venture in identifying the bamboo clusters within the country and in developing the necessary ecosystem for their full utilization. The main objective of this activity is to attract the attention of each individual from farmer to the wood-based industries towards bamboo utilization. Many bamboo industries have been set up and producing the bamboo products at commercial scale to fulfil the demand of society. In addition, educational organizations also have to identify the importance of bamboo utilization and develop the different bamboo products which can help to the nation's economy and society. In fact, some of educational and research institutes in country are working on bamboo utilization and developing the different bamboo-based products.

Treatment of bamboo

Preservative treatment of bamboo is an important and needy procedure to increase the life span of bamboo products. The treatment can be achieved for the bamboos' used for interior and exterior purposes. Generally, chemicals like CCA (Copper Chrome Arsenate), CCB (Copper Chrome Boron), Borax and Boric acid, ACC (Acid Copper Chromate) etc, at different concentrations applied on bamboo cane to expand the life span of bamboo.

Suitability of bamboo for various products

Bamboo is the promising and eco-friendly alternative material for wood-based and wood-handicraft industries. Bamboo has received increasing attention for industrial applications, especially as raw material for wood-based composites such as particleboard, medium density fiber board (MDF), plywood, oriented strand board (OSB), and oriented strand lumber (OSL), inorganic-bonded board, wood plastic composites (WPC). These products shows produced using advanced processing technology, which exhibit's durability and high strength. This qualities increased market demand for bamboo products (Chaowana, 2013). Bamboo utilization as alternative wood materials such as:-

Construction: Bamboo is a major building material in many countries, particularly in Asia, Africa and South America, because of its strong characteristics, light weight and flexible properties. It can be used for almost all parts of houses, including posts, roofs, walls, floors, beams (Figure-1) etc.



Fig.1: Bamboo constructed House

- Food:** About 200 species of bamboo are suitable for eating. Well known fresh bamboo shoots are delicious and healthy, with high fiber content.
- Charcoal:** Bamboo charcoal is traditionally used as a substitute for wood charcoal or mineral coal. It can serve as a sustainable fuel source.
- Pulp and Paper:** Because bamboo fibers are relatively long, thus can be used for paper production. Bamboo paper practically exhibits the same qualities similar to the paper made from wood. Its brightness and optical properties remain stable.
- Composite Boards:** The use of bamboo in composite boards overcome differences in quality related to the culms. These allow the production of homogeneous products. Bamboo panels have a number of advantages over wooden boards due to their rigidity and durability. Some of bamboo composite products are described below (Figure-2).

Bamboo mat board is a plywood-like wooden board made from layers of woven bamboo mats that have been coated with glue and then pressed firmly together. Bamboo mat board demonstrate

similar properties to plywood and can be used for panelling, housing, doors, furniture, and household utensils. It is more flexible than plywood and can be used for stressed skin panels and

wall bracings for which plywood is not suitable. It is also very suitable as concrete formwork (IPIRTI, 2001).

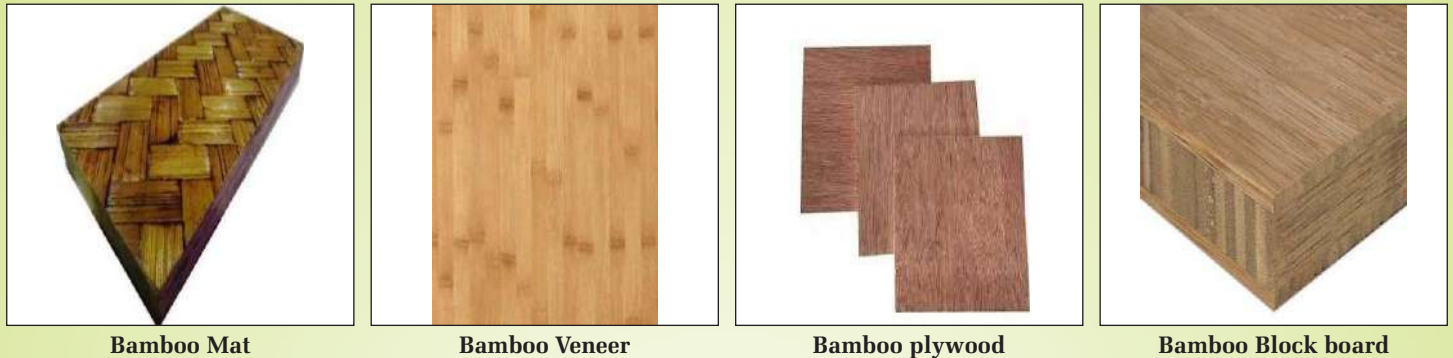


Fig. 2: Bamboo made Composite wood Products.

Bamboo veneer is gaining popularity in the market as it is an eco-friendly material rather than hardwood. It contains natural colour and is well suited for interior designing in hotels, museums, spas, business meeting halls etc.

Bamboo plywood is made of fine layers of bamboo strips laying in parallel order. The strips are kiln dried, sanded smooth and then laminated edge to edge to create a single-ply panel. These panels are laminated again with each other to create multi-ply bamboo plywood with free formaldehyde emission. The multi layers are cross-laminated and heat pressed together to provide stability and to prevent warping. Bamboo plywood has been widely used in building applications, such as flooring, ceiling, walls, windows, doors, fences, housing roofs, trusses and rafters.

Bamboo Block Board is made from core of bamboo strips. These strips may have the width about 25mm. The strips are placed edge to edge and sandwiched between veneers of bamboo. The sandwich is then glued under high pressure.

Bamboo Particle Board: A board manufactured from bamboo particles and other lignocellulosic materials agglomerated, formed and pressed together by use of an organic binder together with one or more of the agents such as heat, pressure, moisture, catalyst etc

Bamboo Fibre Boards: Fibreboard have a homogenous construction because of the uniform distribution of the same type of fibre throughout the thickness of each board (Figure-3). They are free from the defects that are found in natural wood. The absence of grain gives equal strength in all directions along the surface.



Fig.3: Bamboo Fibreboard manufactures process.

6. **Household Products:** House hold products such as agricultural instruments, fishing tools, handicrafts, musical instruments, furniture etc., are made out of bamboo.

Bamboo handicrafts are one among the oldest crafts better known to man. The craft from bamboo cane provide full time employment to thousands of individuals in India. Below are some bamboo handicrafts prepared by students of College of Forestry Sirsi, Karnataka (Figure-4).



Fig. 4: Bamboo Handicraft Product prepared by Students of COF, Sirsi (Karnataka).

Diverse products can be developed from bamboo. Hence bamboo is the best substitute for solid wood which can aid in lowering timber import and mitigate the scenario of timber shortage for wood-based and wood-handicraft industries.

References

1. **Chaowana P** (2013) Bamboo: An Alternative Raw Material for Wood and Wood-Based Composites. *Journal of Materials Science Research*, 2(2): 90-102.
2. **IPIRTI** (2001). INBAR - IPIRTI Transfer of Technology Model: Bamboo Mat Board. Indian Plywood Industries Research and Training Institute (IPIRTI), Bangalore, India. (<https://www.inbar.int/wp-content/uploads/2020/05/1489454897.pdf>)
3. **Sihag K., Negi A., Poonia P.K. and D.P. Khali** (2017). Physical and Mechanical properties of MDF board from Bamboo (*Dendrocalamus strictus*) using Needle Punching Technique. *International Journal of Chemical Studies*, 5(6): 2028-2030.
4. **Ukey P., Poonia P.K. and Kumar A.** (2019). Role of resin content in MDF board fabricated from lignocellulosic fibre of *Bambusa polymorpha* Munro. *International Journal of Chemical Studies*, 7(4): 952-957.

WORLD POPULATION DAY 2021

Deeksha Dave

Environmental Studies, School of Inter Disciplinary and Trans Disciplinary Studies, IGNOU, Maidan Garhi, New Delhi 110068
Corresponding author: deekshadave@ignou.ac.in

Celebration of the World Population Day on 11th July every year is a United Nations' initiative since 1989 when we crossed the 5 billion mark. This day aims at spreading awareness about the exploding world population and the importance of healthy population. The day came about in 1989 when it was established by the Governing Council of the United Nations Development Programme. At that time in 1987, the world's population reached five billion people. World population day is celebrated at international level by organizing variety of activities and events to draw attention of mass people to work together on the issues of growing population.

The celebration of the World Population Day highlights the problems related to over population that we are facing today. It is a day to raise the awareness regarding the trivial issues of population, environmental safety, livelihoods, human health and education. The importance of family planning, gender equality, maternal health and human rights also attract attention.

Several factors determine the population trends. Birth rate and death rate continue to be the major driving force but many times migration and indirect factors also come into play. Population is ultimately determined by the rate of births and deaths but birth and death rates are driven by other factors, like education, economic development, access to healthcare and family planning, and cultural norms. The rapid population growth of the 20th centuries, for example, was largely due to improvements in health, nutrition, and sanitation that lowered mortality rates. Beginning with the Industrial Revolution in Europe, these improvements started to spread around the world and mortality rates, especially among infants, declined rapidly. With people living longer, the overall population grew. Today, people around the world are much more likely to die in old age than in infancy. Industrialization, economic growth, improved education systems, and greater contraception use helped bring about rapid fertility declines in Southeast Asia in the last half-century. Today, rich countries have an average fertility rate below the replacement level of 2.1 children per woman. The countries that still have high fertility rates in the 21st-century tend to be in poorer countries, especially concentrated in Sub-Saharan Africa.

The population increase in the world has several serious implications. Although the birth rate is continually decreasing, still the increase in the number of babies born per year poses risks and problems in future. Hunger, poverty, malnutrition, is the issues which need immediate attention. It is also believed that Sustainable Development Goals (SDGs) are affected adversely because of India's existing pattern of growth in the population. For example, presently, India is producing around 25 million job seekers in the country; however, the country is able to provide jobs only to 7 million. This gap of 18 million is increasing the burden of unemployment and underemployment in the country, turning a demographic dividend into a demographic disaster.

There are several challenges related to population in the country. India is experiencing population momentum and very soon we will surpass China by 2025. We are proud of 3 Ds: Democracy,

Demographic Dividend and Demand. We know that Democracy and Demand are there but to reap the demographic dividend, we need to invest in Education, health, Skilling, etc. The population of India has an average age of about 39 years. This is very beneficial if the country is able to take advantage of it to convert the huge population into a huge demographic dividend. We will have to train this large young population to make it productive, effective, competent and contributing to economic growth. The Indian government, for the next 15 years has to face the challenge to raise the economic status of India from being a low middle-income country to at least a high middle-income country. We also need to create the economic growth momentum by ensuring that investments are adequately made in key infrastructure areas, particularly social infrastructure like education, water and health so that a demographic dividend does not become a demographic liability or disaster.

Since 2018, India's working age population (between 15 and 65 years of age) has grown larger than the dependent population. This period is marked by economic growth and will last till 2055. India's or any other country's population becomes a problem when the demand exceeds the carrying capacity. The rate of increase in population is very fast as compared to the time when we turned 1 billion in 1804. It took 124 years to reach 2 billion in 1927, 32 years to reach 3 billion in 1959, 15 years to reach 4 billion in 1974, 13 years to reach 5 billion in 1987 and 12 years to reach 6 billion and 7 billion in 1999 and 2011 respectively. It indicates how fast we are growing in numbers.

Ageing Population

India is moving towards declining fertility level and there is bulge in the working age population of the country. Ageing Population has economic and social effect. It leads to an increase in the dependency ratio. If the retirement age remains fixed, and the life expectancy increases, there will be relatively more people claiming pension benefits and fewer people working and paying income taxes. The fear is that it will require high tax rates on the current, shrinking workforce. Increased government spending on health care and pensions. Also, those in retirement tend to pay lower income taxes because they are not working. This combination of higher spending commitments and lower tax revenue is a source of concern for Western governments – especially those with existing debt issues and unfunded pension schemes.

Human Health

Human health and increase in population are inextricably related. Airborne diseases spread easily and fast in a denser population. Urban crowding and changes in the environment due to over-exploitation of resources by humans can lead to the emergence of various infectious ailments. A large number of people are already dying each day due to exposure to contaminated water. Imagine the condition 10 years later if the growth of the population keeps on increasing resulting in more and more need of fresh water. How will we be able to sustain such a huge population and provide them with safe water? Contaminated water is one of the easiest ways for viruses to spread faster in denser population. Utilization of such water can claim various lives. Population explosion leads to increased use of vehicles and construction of buildings resulting in increased toxic air contents. This will gradually affect your respiratory system and you may develop diseases like asthma, congestion, chest pain. A decrease in air quality can also cause throat inflammation cardiovascular diseases etc.

Population dynamics matter for sustainable development

Population growth, population ageing and decline, as well as migration and urbanization, affect virtually all development

objectives that are on top of national and global development agendas. They affect consumption, production, employment, income distribution, poverty and social protections, including pensions; they also complicate our efforts to ensure universal access to health, education, housing, sanitation, water, food and energy. Population dynamics do not only pose challenges, they also provide important opportunities for more sustainable development. A fall in fertility levels and slower population growth, for example, leads to an increased concentration of the population in the working age range, which can enable countries to reap a demographic bonus and jumpstart economic development.

Migration can be an important enabler of social and economic development. Today, more than a billion people rely on international and internal migration to escape from poverty and conflict, adapt to environmental and economic shocks, and improve the income, health, and education of their families. Urbanization can be a powerful driver of sustainable development. Higher population density enables governments to more easily deliver essential infrastructure and services in urban areas at relatively low cost per capita

We have to address the challenges and harness the opportunities of population dynamics to promote sustainable development. Population dynamics are the result of individual choices and opportunities. To address and harness the opportunities of population dynamics for sustainable development, countries should seek to enlarge, not restrict, individual rights. Countries should work to expand people's choices, resourcefulness, creativity and resilience, by adopting policies that are human rights-based and gender-responsive.

Human rights-based and gender-responsive policies, such as promoting universal access to sexual and reproductive health and rights, including voluntary family planning, and to education, including comprehensive sexuality education, can make a world of difference for people and societies. Rights-based and gender-responsive policies are also critical in a context of low fertility and rapid population ageing or population decline. Policies addressing low fertility should promote a better work life balance and ensure access to essential services, such as child care and social protections

A human rights approach is also crucial in migration policies, which should be designed in full respect for, and protection of, the human rights of migrants and migrant workers. Such policies can generate large economic and social gains from migration, while ensuring decent living and working conditions for migrants. A rights-based approach is essential, as well, in choosing policies for addressing urbanization and sustainable settlement patterns. Many countries are facing baby bust means less number of children.

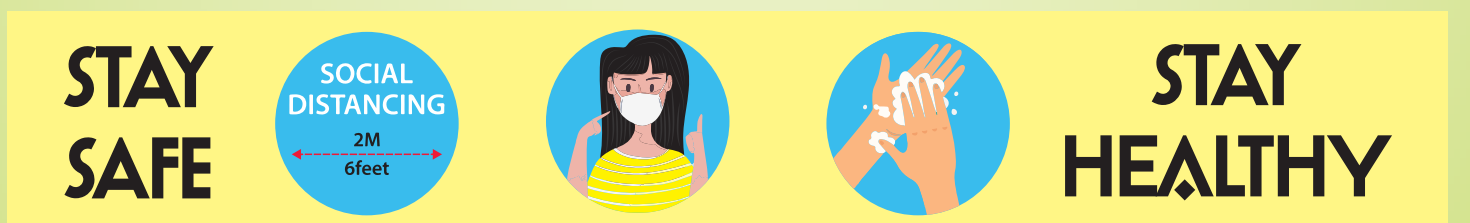
Covid 19 and Impact on Population

As per reports, there were an estimated 7.8 billion people living on Earth as of March 2020, and with the ongoing COVID-19 pandemic, the number is expected to rise due to unplanned pregnancies. Moreover, women disproportionately work in

insecure labour markets and are harder hit by the economic impacts of COVID-19. Nearly 60 per cent of women worldwide work in the informal economy and are at a greater risk of falling into poverty. Women's unpaid care work has increased as a result of school closures and the increased needs of older people. As countries remain in lock down, supply chains that ensure the availability of contraceptives are not delivering. But COVID-19 is not only posing risks to girls and women, but also to the old and youth. It is on record that older people, particularly those who are 60 years and over, are succumbing more to the coronavirus. The implication is that this demographic will need more resource allocation for COVID-19 prevention and treatment, which will be an extra burden to already stretched national budgets due to economic shutdowns. Adolescents and the youth have been caught up in the middle of the pandemic. On one side, their future has been disrupted, mainly due to the massive closure of educational institutions. In countries like Kenya, the government has finally cancelled the 2020 school calendar, which will delay national exams until 2021, and require pupils and students to repeat classes. Massive economic damage also means that economic recovery efforts might take long to break even, greatly hampering job and business opportunities for the young as they leave college. Still, this young demographic holds the world's future prospects. While their welfare must be safeguarded, it is vital that they are also involved in pandemic mitigation measures to avoid irreparable damage to their future. UNFPA observes that "young people can be an important resource in mitigating risks, and community outreach in this crisis." .60 % people in urban areas live in crowded areas .26 million couples had no access to contraceptives due to lockdown in 2020.50 % or more frontline workers that women could not access antenatal facilities due to lockdown. Young people in Bihar, UP and Rajasthan reported an increase in unmet need for reproductive health, services and sanitary pads during lockdown. 1.9 million women in India not able to access abortion services. There was also a rise in gender-based violence, female genital mutilation and child marriages. Reports have shown that domestic violence had increased globally amid the lockdown. The National Commission on Women. Women also account for the largest share of front-line health workers, according to a United Nations report. In India, amid the lockdown, there have been many instances of pregnant women unable to reach health care centers for delivery. Around 60 per cent of women across the world earn their livelihood by working in the informal sector, according to the report.

Way Forward for India

There is a need in the country to invest more in the health sector. The family planning budget is only 4% of the entire health budget and within that India spends only 1.5% on birth spacing methods. Education plays an extremely important role in empowering women as well as to bring about a decline in fertility. *Education is the best Contraceptive*. India can achieve a number of SDGs if it links them with family planning. It is the prerogative of the country's government, citizens, civil societies as well as the corporates to promote family planning measures and to ensure that every child that is born proves to be an asset to the country. This World Population Day let us take the necessary steps on our part to ensure that.



NESA Office Visit by Prof. Tasneem Fatima from Jamia Millia Islamia

A visit was done in NESA office by Prof. Tasneem Fatima from Jamia Millia Islamia, New Delhi for receiving the Fellowship 2019 award on 21st August 2021.

A discussion for some event in the Jamia Millia Islamia with Prof. Tasneem Fatima & with her department in near future. Also

discussed regarding the NESA and JMI can do some project work in near future after going through the terms and conditions.

Some photographs are given below as Prof. Tasneem Fatima received her Fellowship Award from Prof. Javed Ahmad, President, NESA. Prof. Tasneem Fatima thanked Prof. Javed Ahmad who was personally interested to give this award to her in her faculty at Jamia Millia Islamia, New Delhi.



APPLICATIONS ARE INVITED FOR NESA ANNUAL AWARDS 2021 HURRY LAST DATE 30 September, 2021



<http://nesa-india.org/life-membership-nesa-india/>
<http://nesa-india.org/award-form-submission/>

NESA PUNJAB CHAPTER CONDUCTS PLANTATION DRIVE, IRRIGATING PLANTS/TREES TO OBSERVE VAN MAHOTSAV WEEK-2021

Syed Shabih Hassan

Joint Secretary, National Environmental Science Academy, New Delhi

Corresponding author: hassan03048@gmail.com

National Environmental Science Academy (NESA), Punjab Chapter conducts plantation drive, irrigating plants/trees on the occasion of Van Mahotsav Week-2021 under the supervision of Dr Syed Shabih Hassan. Active members and local people planted 150 saplings and irrigated more than 1000 plants covering shaded trees, herbs, shrubs, medicinal, fruiting and flowering plants by adopting slogan "Clean Ludhiana, Green Ludhiana" to commemorate Van Mahotsav Week-2021. Active members took pledge to protect and nurture the existing plant in schools, colleges, including parks, lawns, hedges, roadside and efforts to save our precious forest and earth planet.

Dr Syed Shabih Hassan told that how long can we ignore the destruction that anthropogenic activities are causing, and emphasized for adopting sapling plantation during Van Mahotsav week. Dr Syed Hassan also told that we must visit planted sapling sites twice in a week and nurture at least ten plants into a strong plant. The aim is to focus



on the importance of nurturing sapling plantation and changing the habits among people who abstain from nurturing plants or conserving the natural resources and making local people become dutiful towards our surrounding environment. During the occasion, Dr Syed Shabih Hassan, Chairman, NESA Punjab chapter told to be a green warrior by adopting many fruitful activities, we as responsible citizens can continue our interrupted lifestyle while also creating a healthier and greener future for our generations to come.

Dr Syed Hassan also emphasized on forestation, reforestation, pristine quality of water, disadvantages of deforestation and the importance of ornamental, flowering, fruiting, medicinal plants, shaded trees, herbs and shrubs in purifying the air, as natural resources, preventing soil erosion, maintaining ecological balance, habitats for large and even small tiny animal species and providing nutrients to the soil and stressed more interaction for preserving the environment.

Dr Syed Shabih Hassan, Chairman, NESA, Punjab chapter also pointed that one tree can sequester anywhere between 3 to 10 kg of CO₂ every year, so plant and nurture at least 50 trees because it reduces annual CO₂ emissions by 183-500 kg every year for 100 years for protecting and conserving the natural resources. Dr Hassan also told to adopt plant on personal occasion like birthday, father, mother's birthday, marriage anniversary day, and holidays such as Sunday, Republic Day, Independence Day as well as during Van Mahotsav Week because trees are the lungs of our land, purifying the air and giving fresh strength to our people. Earth's forest, its constituents and beautiful surroundings is the greatest gift to human beings given by Almighty God and therefore it is our responsibility and utmost duty to save this precious land and

forest by individual actions.

We can save it by a number of ways. It is necessarily not just to plant a tree, but to protect, nurture and irrigate it in a better way and adoption by individual action. Dr Syed Hassan informed that we should not burn leaves and other horticulture waste, we can go for composting

and we should try to exhort various ways in collaboration with NGOs for the same. Dr Syed Shabih Hassan highlighted the significance of Van Mahotsav Week and need for continuous efforts from local people to adopt more productive sapling plantation and nurturing the plants into strong plants in daily life to get oxygen (O₂) free for healthy and prosperous surrounding environment and the earth where we are living to maintain the ecological balance for protecting the Forest and Earth greenery, so plant more and more trees and "Go Green".

हर घर में पेड़ लगे और हरियाली चारों ओर हो।



appeal

Let fight it together

PLEASE TAKE YOUR VACCINE!!

WEAR MASK - STAY HOME STAY SAFE

PLEASE PLANT A TREE FOR CLEAN AND BETTER ENVIRONMENT

A NATURAL MAMMALIAN POLLINATOR SERVING NUMEROUS ECOLOGICAL RESPONSIBILITIES

S. K. Basu

PFS, Lethbridge Alberta Canada.

Corresponding author: saikat.basu@alumni.uleth.ca



Bats are outstanding natural pollinators facilitating cross pollination in a wide diversity of flowering plants. Not many people know that in tropical and subtropical forests several tree species with flowers at the very high canopies are exclusively dependent on nocturnal bat pollination for their survival. They perform an outstanding ecological service to maintain the dynamics of our natural ecosystems. Furthermore, they also play an important role in controlling insect numbers by consuming a large number of insects every night. Unfortunately they are misrepresented in our society and there is an acute lack of education and awareness about the importance of bats in our ecosystems.

There is an increasing awareness about bat conservation in many countries in North and South America, Europe and Asia. But more work needs to be done to protect this majestic species from extinction as their numbers are dwindling rapidly. It is therefore necessary to start a comprehensive bat conservation program. In spite of the great ecological role played by the bats in our ecosystem; historically and socioculturally they have always been branded with numerous superstitions like black magic, evil deeds and thoughts, bad karma, symbolic representation of future death and destruction, diseases and negative influence on our lives. The cult classic literary character Count Dracula by novelist Bam Stroker has further imprinted in people's mind unnecessary fear and negative feelings towards bats for centuries.

There are many people around the world who think that every single bat to be a vampire thriving on animal and human blood. But truly speaking only a handful species, for example a few small cave bats in Mexico and Central America are actually vampires feeding on the blood of livestock. However a wide diversity of bat species are actually frugivorous (eating fruits), consume floral nectaries and different insects.

Some carnivorous species are also known to science. It is also true that the bats are carriers as well as host for various parasites and viral borne diseases. But it is some ethnic groups from Asia and



Africa who like bat as food sources are responsible for the spread of bat viruses. The bat themselves could not be held responsible for this. It is the human consumers, poachers, hunters, wildlife traders and marketers who are truly responsible for this. Hence, we can conclude that in spite of the positive ecological role that bats play in nature; we as humans have mistreated them due to our ignorance, fear, lack of education and awareness and lack of empathy towards bat biology, bat behaviour, diets well as bat nesting and foraging practices.

Only fairly recently we are coming to understand that a bit more than we have done in the past. But it is too late, since several species of bats worldwide are showing signs of significant population decline due to uncontrolled poaching, high demand for bush (wild) meat in illegal wildlife markets operating in various parts of Asia, Africa, Latin America and in other continents, pollution, extensive use of pesticides in agriculture, anthropogenic forest fires, drastic loss and fragmentation of bat habitats and lack of food sources for them. Under the circumstances, it will be very important to establish comprehensive conservation strategies for protecting the bats worldwide. Unless we act now, it may be too late to save our friendly bats from complete extinction in the not so distant future.



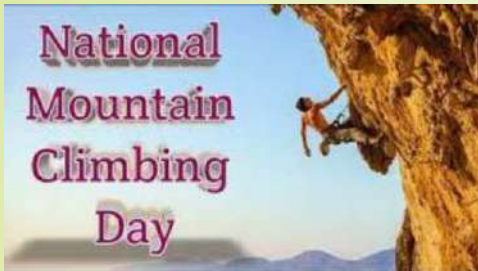
ACTIVITIES AND SPECIAL DAYS AT A GLANCE IN THE MONTH OF AUGUST 2021

V. Sunitha

Department of Geology, Yogi Vemana University
Kadapa, A.P, 516005

Corresponding author: Vangalasunitha@gmail.com

1 August - National Mountain Climbing Day



National Mountain Climbing Day is commemorated every year on August 1st to honour Bobby Mathews and Josh Madigan. In 2015, the two men ascended the

Adirondack Mountains' 46 High Peaks in New York State.

1-7 August - World Breastfeeding Week



It is a worldwide promotion that takes place every year in the first week of August in a number of nations. The inaugural World Breastfeeding Week was held in 1992.

1 August (First Sunday of August) – Friendship Day

Friendship Day is observed on the first Sunday in August, which falls on August 1, 2021. In the United States, a custom of designating a day to friends originated in 1935. Friendship Day grew in popularity over time, and it is now observed in a number of nations, including India.

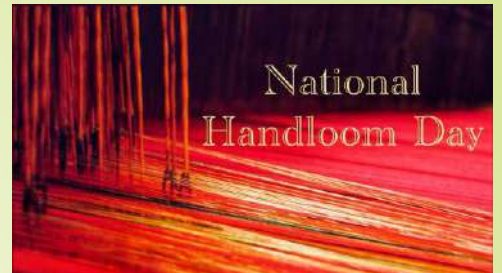


6 August – Hiroshima Day

Every year on August 6, Hiroshima Day is commemorated. The atomic bomb was dropped on the Japanese city of Hiroshima on this day.

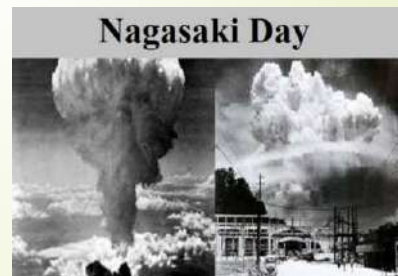
7 August - National Handloom Day

Every year on the 7th of August, the country's handloom weavers are honoured. It is commemorated every year to mark the start of the Swadeshi Movement in 1905.



8 August – Quit India Movement Day

Mohandas Karamchand Gandhi started the 'Quit India Movement' during an All India Congress Committee meeting in Bombay on August 8, 1942. It's also known as August Kranti or August Movement.



Nagasaki Day

9 August - Nagasaki Day

The United States unleashed a second bomb on Japan at Nagasaki on August 9, 1945, and the device is known as 'Fat Man.' It was dropped three days after Hiroshima was bombed with an atomic weapon.



9 August - International Day of the World's Indigenous Peoples

Every year on August 9th, the United Nations' International Day of the World's Indigenous Peoples is commemorated to inspire people all over the world to disseminate the UN's message of indigenous peoples' rights protection and promotion.

12 August – International Youth Day

International Youth Day is celebrated on 12 August around the

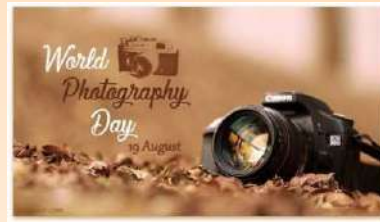


globe to focus on the development and protection of youth in the society.

12 August: World Elephant Day

Every year on August 12th, it is commemorated to raise awareness about the need of

preserving and protecting elephants. This is how the entire globe can come together to help elephants.



19 August - World Photography Day

Every year on August 19, World Photography Day is commemorated to promote awareness about the value of photography.



19 August - World Humanitarian Day

Every year on August 19, the globe commemorates World Humanitarian Day to honour humanitarian workers who put their lives on the line to help others. This day also recognises the contributions of women in crisis situations around the world.



13 August - International Lefthanders Day

Every year on 13 August Lefthanders Day is observed. It raises awareness about the problems and difficulties that left handed persons faced.

20 August - World Mosquito Day

Every year on August 20th, World Mosquito Day commemorates the discovery in 1897 by British doctor Sir Ronald Ross that "female mosquitoes transmit malaria between people."



13 August - World Organ Donation Day

World Organ Donation Day is observed on 13 August to spread awareness about the importance of organ donation.

15 August - Independence Day in India

Every Year on 15 August, India celebrates Independence Day. As on this day, India got freedom from British rule. It makes us remind about a new beginning, the beginning of a new era free from British colonialism of more than 200 years.



20 August - Sadbhavna Diwas

Every year on August 20th, Sadbhavna Divas is held to honour the memory of our late Prime Minister Rajiv Gandhi. Sadbhavna is a Sanskrit word that signifies "goodwill" and "sincerity."

20 August - Indian Akshay Urja Day

The annual Indian Akshay Urja Day is held on August 20th to promote awareness about India's renewable energy development. It's a campaign that's been going on since 2004. Rajiv Gandhi, the former Prime Minister of India, was born on this day.





22 August - Raksha Bandhan

The celebration honours the unbreakable tie that exists between brother and sister. The Rakhi festival will be held on August 22nd in 2021.

26 August: International Dog Day

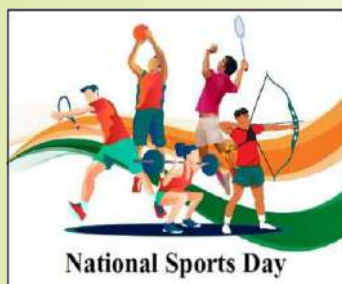
On August 26th, it is commemorated to honour the number of dogs that need to be rescued each year.



INTERNATIONAL DOG DAY

29 August - National Sports Day

Every year on August 29th,



National Sports Day is observed to commemorate the birthday of field hockey player Dhyan Chand. Rashtriya Khel Divas is another name for National Sports Day.

30 August - Small Industry Day

Every year on August 30th, Small Industry Day is commemorated to support and promote small businesses.



30 August - Janmashtami

This year, it will be commemorated on



August 30th. The Janmashtami festival commemorates the birth of Lord Krishna, also known as Kanha. He is regarded as one of Lord Vishnu's most powerful human incarnations. One of the most joyous events of the Janmashtami celebration is Dahi Handi.

**EACH ONE PLANT ONE
STAY SAFE WEAR MASK**

INVITATION OF RESEARCH ARTICLES for PUBLICATION in NESEA Journals

INTERNATIONAL JOURNAL ON AGRICULTURAL SCIENCES

ISSN NO. 0976-450X | NAAS RATING 2.60

INTERNATIONAL JOURNAL ON ENVIRONMENTAL SCIENCES

ISSN NO. 0976-4534

INTERNATIONAL JOURNAL ON BIOLOGICAL SCIENCES

ISSN NO. 0976-4518

INDIAN JOURNAL OF UNANI MEDICINE

ISSN NO. 0974-6056

These JOURNALS ON DIFFERENT SUBJECTS are being published by this Academy. Send your manuscripts for peer-review by e-mail. THE AUTHORS MUST MENTION ADDRESS, Contact Nos. and E-MAIL ID in their forwarding letter. Proof will be sent for correction before publishing. A pledge for originality will be signed by the authors. Five sets of reprints will be dispatched within 30 days after the receipt of the PROCESSING FEE. along with a press print soft copy of final version of manuscript.

For further details and NOTES FOR AUTHORS, please contact Academy at nesapublications@gmail.com infonesas88@gmail.com

**APPLICATIONS ARE INVITED FOR
NESSA ANNUAL AWARDS 2021
HURRY LAST DATE
30 September, 2021**

(1) NESEA FELLOWSHIP AWARD

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

(2) NESEA EMINENT SCIENTIST AWARD

AGE 40 and above. The recipient shall get Citation, Certificate, Memento and a Medal.

(3) NESEA SCIENTIST OF THE YEAR AWARD

AGE 35 and above. The recipient shall get Citation, Certificate, Memento and a Medal.

(4) NESEA ENVIRONMENTALIST AWARD

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

(5) NESEA GREEN TECHNOLOGY INNOVATIVE AWARD

AGE 35 and above. The recipients shall get Citation, Certificate, Memento and a Medal.

(6) NESEA DISTINGUISHED AWARD

AGE 35 and above. The recipients shall get Citation, Certificate, Memento and a Medal.

(7) WOMEN EXCELLENCE AWARD

AGE : 35 and above. The recipients shall get Citation, Certificate, Memento and a Medal.

(8) NESEA YOUNG SCIENTIST AWARD

AGE : Above 35. The recipients shall get Citation, Certificate, Memento and a Medal.

(9) NESEA JUNIOR SCIENTIST AWARD

AGE : Below 35. The recipients shall get Citation, Certificate, Memento and a Medal.

PRESCRIBED APPLICATION FORMS

The application forms can be downloaded from www.nesa-india.org. Separate application forms should be submitted for independent 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*

E-mail: infonesas88@gmail.com • Website: www.nesa-india.org