



CGES Newsletter

CLEAN AND GREEN ENVIRONMENTAL SOCIETY

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VISION

Clean and Green Environment for Healthy Life

MISSION

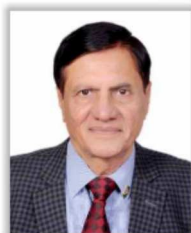
To Strive for A Clean and Healthy World

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Er. Sumer Agarwal

PRESIDENT'S MESSAGE

Dear CGES Fellow Members,

Clean and Green Environmental Society (CGES) is the Brain Child of Dr. S.C. Sharma, Founder Secretary General of the Society. The society was founded on July 8, 2015 by a group of committed environmentalists and engineers. Presently, there are nearly two hundred members from all over the country, among them thirty percent are the lady members. The activities and programmes of CGES have been fast expanding with the active participation of its members. Today, CGES has become the crusader for spreading the educational and environmental activities. CGES had very successfully organized third Foundation Day on 8th of July during last year besides several lectures-cum-training programmes. CGES has also created an Eco-Garden Club, where monthly meetings are arranged for addressing the problems of amateur gardeners and giving them the necessary solutions. So far, four get-togethers have been organized on growing and marketing of house plants, Bougainvillea and its cultivation, history of Bonsai and hands-on training on Bonsai culture and Spices of India, a lucrative business. Recently, a hands-on training on the Bonsai culture was organised at CSIR-IBHT, Palampur (H.P.). It is hoped that with your continued support and guidance, CGES will further diversify its activities by adopting schools and colleges for giving lectures on different topics related to the environment and biodiversity conservation, arranging training programmes for creating general awareness among the society towards maintaining cleanliness, green surroundings, educating women, gardening enthusiasts and farmers in the area of emerging techniques in floriculture, etc.

I convey my best wishes to all our esteemed members and well wishers.

Er. Sumer Agarwal
President, CGES and Chairman,
LEVANA Group, Lucknow-226 001

CGES New Life Members

Padma Shri Awardee Prof. Sudhir K. Sopory, Padma Shri Awardee Prof. Palpu Pushpangadan, Dr. P. Sree Devi, Dr. Surya Kant, Dr. Amrita Dass, Dr. Raj Mehrotra, Mrs. Ruchi Mehrotra, Mrs. Usha Govind Prasad, Prof. Mohd. Abid Ali Khan, Dr. Bhavya Bhargava, Dr. Seema Ghate, Mr. Shirish Ghate, Mr. Aditya Tripathi, Mr. Ramesh Kundra, Dr. Nandita Singh, Mr. S. P. Singh, Mr. Sunil Singh Panwar, Prof. Chen Tao, Prof. Edwin Grill, Mrs. Regina Grill, Prof. V.M. Prasad, Mr. Yogi Tripathi, Dr. Mratunjay Kumar Singh, Mr. Nawneet Srivastava, Mrs. Arpita Bhattacharya, Mr. Reshubh Agarwal, Anjali Upadhyay

Obituary

During the last one year, we lost our two Senior Advisors Er. S.P. Kalsi and Shri Rakesh Mittal. CGES will remain indebted for their outstanding contributions to the society.

Trade off Between Human Needs and Environment

C. R. Bhatia

Trade off between human needs and environment (air, water and soil) has always existed. Even for the early humans when they survived on this planet as food gatherers and hunters. Collecting grains from natural stands continuously, year after year, must have caused considerable loss of biodiversity, and depletion of soil fertility. The main difference from the present was the limited number of people, in relation to the vast natural resources. However, in present the hunters and food gatherers must have felt the shortage of the desired animals for killing in nature and hence, later, they were domesticated and reared on farms.

New knowledge and human innovation

New knowledge and human innovation have played an important role in the evolution of human societies, and shall continue to be the main source for meeting their needs in the times to come. Evolution of farming and food production played a significant role in the evolution of the present human civilization. In past, the environmental effects of the new innovative technologies were not apparent immediately and were realised many years after the wide adoption of the new technology. In recent times, this was true for the insecticide DDT and the so called, green revolution technology for semi-dwarf plant type for rice and wheat that did not lodge any associated disease after application of nitrogenous fertilizers and pest control measures. This almost doubled their productivity in many areas. However, environmental changes and global warming has caused sea rise enforcing many to leave their ancestral homes close to sea, and turned them into environmental refugees.

We are living better

It should be widely appreciated that human life in the present times is much better, safer and comfortable than it had ever been in the past, despite the environmental perturbations resulting from human activities that we face. Most enjoy comfortable housing, nutritious food, safe water, reliable transport, good health care, and round the clock entertainment through radio, television and connectivity through mobile phones. These luxuries are dependent on 24x7 electric supply. Clean air to breathe, water resources and abundance of fertile soil remain the major environmental constraints. Food and energy security remain a matter of concern.

Food

The history of food production is best described as getting "more for more". More and more land was brought under cultivation after clearing of the natural vegetation. More land under farming produced more food. Later, more and more food was produced by increased application of fertilizers and pesticides. The more land we farmed, the more food we produced. From the environmental considerations the increased use of water, fertilizers and pesticides created problems though the harvests were more bountiful. While modern farming successfully feeds billions of people, its rapid expansion has also led to biodiversity loss, polluted waterways and raised greenhouse gas emissions. Current rise in carbon dioxide levels are also making our food less nutritious, robbing key crops of vitamins essential to human development. As the world population climbs toward 10 billion people and the impacts of climate

change set in, this approach is presently considered not sustainable for the future.

Water

Ground water levels are going down and down around most urban settlements due to over use and poor recharge. Rain water falling on open spaces runs off instead of percolating down due to cemented or tarred surfaces. Water levels in tanks and other reservoirs that store rain water and contribute to recharge of ground water are often dirty with plastic waste which have depleted holding capacity due to silting.

Energy

Energy is the main driver of the modern life style. The current, most important environmental problem of global warming- the cause of climate change is also due to increasing energy demand. Energy is also important for food production as it derives most field and post harvest operations, including cooking. Originally, fire wood was the main source for heat and cooking, and then came the coal used directly or for generating electricity and subsequently the other liquid fuels replaced coal for power generation and transport. In the early days of nuclear power, it was said that it would be so cheap that there would be no need to meter the supply. Nuclear power from fusion still remains a dream. Meanwhile, other renewable sources have been developed. Solar energy is a reality in many areas, though the problems of storage persist. New innovations and knowledge of new materials are likely to enhance the use of solar energy.

Transport

All materials, including farm produce, needs to be transported to markets, and to individual consumers. People also need transport to and from their place of work. Using fossil fuels increase the concentration of carbon dioxide in the air. Using electric vehicles for transport reduces carbon emissions.

Carrying capacity

Ecologists define carrying capacity (CC) of the ecosystem as the population of humans and animals that can be sustained, based on the primary productivity of plants with the available resources—soil, water, energy and environment without damaging the resource base. Others identify CC as the maximum number of individuals of a species that can be supported on a sustainable basis. CC is not a static number and land productivity can be enhanced by inputs of water, energy and plant nutrients, crop genotypes grown and advanced technologies. Estimations of human CC are not easy due to a large

number of variables involved, and large variation in the use of resources by individuals. CC is determined by the primary productivity of plants/crops. The global CC increased when humans shifted from nomadic hunters and food gatherers to cultivation of crops and domestication of animals. Yet another increase of global CC came with the chemical fixation of atmospheric nitrogen into synthetic fertilizers. The green revolution technology based on semi-dwarf rice and wheat further increased the CC. It is suggested that CC can be further enhanced by consuming only plant based foods. Wider use of electric vehicles for transport and solar energy can enhance CC.

NEW INNOVATIONS ON THE HORIZON

Vertical farming

There are many new developments on the horizon that can enhance food production and reduce the demand of land area. After reclaiming land from sea, as in the Netherlands, vertical farming in urban areas is one such possibility. To overcome the shortage of land, humans have universally opted for vertical housing and working place. The same is being adopted for crop production, animal housing in some countries. Even urban forests in urban high rise buildings have been developed. Living display panels have been developed for shopping areas. The cost is recovered by using them for advertising. So far, vertical farming is limited to greens and fruits such as strawberries in large cities. Plants are grown under LED lights, and hydroponic systems leading to the availability to fresh produce, and considerable saving on energy used in transportation and water use. The overall energy demand is higher, while the water requirements are reduced. Further, more field land is made available for traditional farming.

Carbon capture

Carbon capture is a process of capturing waste carbon dioxide from large point sources, such as a biomass power plant or a cement factory or any other such sources. Various systems for increasing carbon capture directly from air through plants are being developed using innovative ways for urban areas.

Advances in crop cultivar development adopting new genetic knowledge, tools, and techniques based on novel information

Since the initiation of the Mendel's laws of inheritance, advances in genetic knowledge have provided a rational basis for crop improvement. Chromosome number, polyploidy, doubling of the chromosome number using colchicine, synthesis of amphiploids, induced mutagenesis, and DNA

structure provided many new tools for plant improvement. In recent year's genomics, marker assisted selection and QTL's have added new possibilities. New knowledge in genomics, artificial intelligence, automatic data collection using drones and other remote sensing devices are being used in breeding programs to accelerate development of new cultivars. Artificial intelligence tools are being used to analyze the vast amount of data collected. This would reduce the time required or the development of new, superior cultivars.

Protocols for introducing alien gene(s) either by *Agrobacterium* mediated or direct transfer using protoplast cultures have been developed to produce transgenics (erroneously designated as GMOs). Many such GMO crops are under commercial cultivation in more than 39 countries. It is important to recall that all most all GMO crops have been developed by private initiative and funds.

In order to overcome some of the environmental objections against the transgenic crops, many are currently using the gene editing techniques. Though, some of the regulating agencies consider the gene editing similar to transgenics. Gene silencing using RNAi(RNA interference) is yet another possibility. With new advances in the knowledge of the genetic material (DNA), and overall progress in other areas of science, new and more precise techniques are to be expected in future that would greatly alter, and ease, the genetic enhancement of plants, minimizing their environmental impact.

Prospects of reducing environmental impact and protection against climate

Sustainable intensification will be one way to meet the growing demand by continuing intensification of water, energy, and food demand by adapting the policy aiming at more with less. Going by the past experience, the prospects for this do not look very promising.

REDUCING DEMAND FOR FOOD, WATER AND ENERGY

Limiting population growth

The demand for food and other human needs such as housing, transport, recreation can be reduced by a gradual decrease in the number of humans or at least, their growth rate can be considerably reduced to bring in balance with the carrying capacity.

Reducing consumption

Demand for the products can be brought down by major changes in the current life style. The question

remains, Are we willing to change our life style, and to what extent? Can people adapt to simple living? If yes, what we are willing to forego? Food we consume? Housing we live? Personal transport? Energy consumption? Mobile phones?

Increasing water harvesting

Ground water recharge can be enhanced by increasing the harvest of the rain water. Grass lands are ideal for slowing the run off, and increasing downward percolation.

Reducing wastage

Lot of food, water and energy are wasted. Social and individual changes in our thinking and actions we are willing to take by the affluent, poor and middle income groups will largely determine our environment and future.

This brings to the global issues of poverty, inequality of incomes, and affluence of the few. Though the environment affects all the sections in the social stratification of the society, it is perceived differently by the social groups. The affluent overcome these environmental changes while the poor remain the main victims.

ENVIRONMENTAL PROBLEMS ARE COMPLEX AND NEED INDIVIDUAL AND SOCIETY SACRIFICES

Environmental problems are complex and often have several components. Success is more likely by establishing priorities, and solving them one by one, keeping the overall objective of reversing the environmental damage. Ultimately, the reversal will be determined by how much, as an individual and global society, we are willing to sacrifice. Environment has no state or national boundaries. Burning of rice crop residues in Haryana and Punjab states causes smog in Delhi with reduced visibility and severe health problems. The same is true in other parts of the world.

Time to act is now, before the environment takes its toll for neglecting it in many different ways for obtaining more food, energy and water for ostentatious living.

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Nutrient Receptors and Transport Proteins in Plants

Yogesh K. Sharma

In higher plants, the mineral nutrition is of fundamental importance to agriculture and human health. It is surprising how plants ensure that all tissues receive desired supply of the nutrients, required for vital cellular processes, and what prevents them from accumulating their toxic levels? Metal ions need to be transported from the soil solution into the root and then distributed throughout the plant, crossing both cellular and organellar membranes. The availability of molecular tools made it possible to peep into it. A number of genes involved in metal transport in plants have already been identified.

There is now considerable interest in the area of metal transport because of the implications for phytoremediation (defined as the use of green plants to remove pollutants from the environment) or to render them harmless. The heavy metal ATPases which have considerable potential as key heavy metal transporters in higher plants, are involved not only in normal metal ion homeostasis but also in the overall strategy for heavy metal tolerance. In addition, the natural resistance-associated macrophage protein (Nramp), cation diffusion facilitator (CDF) family of proteins, ZIP and many other proteins are involved in relation to heavy metal transport. Zinc transporter proteins, or simply zinc transporters, are membrane transport proteins of the solute carrier family which control the membrane transport of zinc and regulate its intracellular and cytoplasmic concentrations. Acquisition systems are up-regulated during metal starvation, and efflux pumps are activated when metals are in excess.

Pathogenic bacteria use several strategies to acquire iron. These include import of ferrous iron by ATP- or GTP-dependent inner membrane transporters, and TonB-ExbB-ExbD dependent transport of ferric-siderophores, transferrins, haem or haem-bound proteins through specific outer membrane receptors. Indeed, extracellular iron, mostly present in its ferric (Fe^{3+}) form, is bound to circulating transferrin. Ferritin promotes intracellular iron storage. Several laboratories have already engineered plants to overexpress the iron storage protein ferritin. Numerous genes controlling these crucial steps of Pi or Zn transport in plants have been identified, and characterized at the molecular level, including the high affinity phosphate transporter (PHT1) The *Arabidopsis ZIF1* gene and the two other ZINC-INDUCED FACILITATOR-LIKE genes (*AtZIFL1* and *AtZIFL2*) form a distinct membrane protein family involved in regulating Zn homeostasis.

Tolerance to high concentrations of these metals in species and cultivars that can grow on metal-polluted soil could conceivably be achieved by excluding the uptake mechanisms from the root, or by efflux or compartmentation and detoxification of the metals following uptake. A comprehensive understanding of metal transport in plants is essential for developing schemes to genetically engineered plants that accumulate specific metals, either for use in phytoremediation or to improve human nutrition.

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Conservation of the 18th Century Gardens of Khajuraho

Anjaneya Sharma

Gardens of Khajuraho are Royal Gardens of 18th century in Khajuraho/Rajnagar (Madhya Pradesh, India). The Belgian chapter of the Indian National Trust for Art and Cultural Heritage (INTACH) has taken up this project to restore these gardens and turn them into training centres for sustainable, organic agriculture. Moreover, the project aims to promote sustainable tourism. Everything is being done with the help of the local population and for its benefit. The main features of the project comprise the following:

- The historically informed reconstruction of the Royal Gardens of Khajuraho with the help of local craftsmen and local knowhow.

- The creation of a community seed bank with local varieties of vegetables and fruits and the cultivation of these varieties.
- Development through sustainable cultivation techniques such as conservation agriculture and tourism.

Rajnagar is a small town 3 km north of Khajuraho (UNESCO world heritage site) in Madhya Pradesh. Rajnagar was the regional administrative center during the Chhatarpur Princely State period (est. 1785, carved out of the Panna Princely State- est. 1707). Rajnagar literally translates as the 'City of the Kings' (*Rajaonka Nagar*). A number of Chhatarpur

state period structures are still present in Rajnagar even today. The gardens of Rajnagar are also part of this rich architectural and cultural legacy. These produce gardens share the same features: they are walled, with a small Shiva temple, an outhouse (*kothi*), memorial platforms (*Samadhi*), several wells (some are stepwells), irrigation channels and their areas ranging within 2 to 6 acres. These gardens along with their irrigation and agricultural methods formed a unique self-sustainable micro ecosystem, which now faces the rapid process of urbanization as a threat to their existence. In 1998, INTACII was the first to document six gardens of similar built elements and architectural styles. The history of these gardens is largely unknown. A complimentary report containing the listing of the heritage structures of the 'Khajuraho Heritage Region' was also published along with the 1998 report. In this report eleven gardens were listed. Later five more gardens were identified by INTACH Belgium during their course of work since 2004 in and around Rajnagar. Thus the extended list of gardens indicates the existence of at least 16 gardens in Rajnagar. The name of the gardens are: Nagjika Bagicha (now known as Pateriyaka Bagh), Rani Bagh, Ram Bagh, Duanka Bagh (or Dauwwanka Bagh), Nathu Khan Rangrejka Bagh (now known as Khan ka Bagh), Bada Bagh, Ramdin Sonika Bagh (now known as Sonika Bagh), Gokaran Bagh, Najar Bagh, Ramdin Tiwari Bagh (now known as Tiwari ka Bagh) and Basir Mat Sahib Bagh. The garden complex of Radha Madhav temple also has similar features as that of the above listed gardens. There are evidences of Sati ki Madhiya (only a temple and a well remain now), Farm field adjacent to Gokulan Bagh, Nagar Seth ka Baghicha in the vicinity of Tiwari ka Bagh and memoir Chhatri of King Pratap Singh at Khajuraho.

The history of these gardens is unknown, as the reason for such an incredible concentration of sixteen gardens in Rajnagar. This type of gardens has never been studied before. Archives do not exist, and the oral tradition is scarce. From bits and pieces, we have been able to reconstruct the following story:

These gardens have been created by the Royal family of Chhattarpur in the second half of the 18th century / beginning of the 19th century as produce gardens for vegetables, flowers and fruit. Probably every garden is connected with an heir prince, who would – after having reigned as a king, have been cremated in his garden as might have been the case with his close relatives. These gardens were no permanent living quarters but the king and his family would stay in tents whenever they travelled through the region or came to assist to the religious festivals in Khajuraho. The outhouse (*kothi*) would have been the storage room for the tents and other household gear.

Apparently this type of gardens is only to be found in the Bundelkhand region. One year before passing away, the last Maharaja of Chhattarpur told us about his souvenirs when he travelled from one garden to the other with his mother until they reached their final destination. In other words, the gardens were a kind of royal caravanserai. After the Indian Independence (1947) the larger number of gardens came into private hands, as gifts from the Maharaja.

The Architecture of the Rajnagar Gardens

The elements of these gardens are as under:

A *kothi* is thought to have been present in every garden. The *kothi* plan is a rectangle, with an arched opening in the longer wall-forming an entrance. The *kothi* rests on a raised plinth extended in front of *kothi*. Stairs were provided adjacent to one of the shorter side of the rectangle. On the first floor, a room had been built above the mummy (staircase tower), leaving the rest of the area as an open terrace.

In most of the gardens, the temple plan is square with single chamber (*garbhagriha*) resting upon a raised plinth and provided steps from the front. Some of the temples have one more chamber added to the *garbhagriha*, i.e. *mandapa*. All the temples have a *Shivalinga* as the deity. The shikhara of the temples are of *panchayatana* style- the main shikhara in the centre and four smaller shikhara/chhatri in the four corners.

One or more wells are present in every garden, mostly circular or octagonal in shape. The wells with steps provided along their walls to go inside the wells- are called '*Baoli*'. Although baolis are now absent in some of the gardens, people narrate that earlier there were baolis in every garden. Water channels originate at the wells and baolis, facilitating irrigation in the garden. The water channels were laid in slope to ensure the smooth movement of water through the field (gravity driven irrigation). A narrow pathway for the supervision of crops are lining the water channels. Memorial platforms (*samadhis*) are inseparable element of these gardens. Rectangular, square or octagonal raised platforms were made to honour a deceased person. In some of the gardens the memorial platforms were elaborate, indicating the social status of the deceased. The plantation in the gardens invariably included mango trees and local vegetables along with certain varieties of grains and pulses. Sometimes the cultivation of flowers is also mentioned.

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Pest Management Practices in Vegetable Crops of Lucknow

Madhu Prakash Srivastava and Ritu Srivastava

Pesticides play an important role in sustaining vegetable production by observance pest population below economic threshold level. The average pesticide consumption in India is around 0.381 kg a.i./ha as compared to world average of 0.5 kg a.i./ha. Around 13-14 per cent of the total pesticides used in the country are applied solely on vegetables. Among different vegetable crops, the maximum pesticide usages are found in chilli (5.13 a.i kg /ha) followed by brinjal (4.60 a.i kg /ha), cole crops (3.73 a.i kg /ha) and okra (2-3 a.i kg /ha).

The green revolution resulted in significant enhancement in vegetable production but with insufficient concern for crop, soil and health sustainability. Excessive reliance on pesticides for future vegetables sustainability would mean further loss in soil health and productivity, increase in water contamination and farmers and consumers related health hazards. The persistent toxicity/residual toxicity of different insecticides mixture, bio-pesticides and botanicals must be taken in consideration for suppressing the residual population of the pest is another important aspect of pesticide contamination.

Instead of continuing with same government policies, there is need to have a well thought out and coordinated approach which successfully break the existing stagnant production tendency in agriculture. The aim of this short article was to be acquainted with farmers' pest management practices in four important vegetable crops, viz. chillies, tomato, brinjal and okra in the Bakshi ka Talab tehsil of Lucknow district.

Socio-economic impact of indiscriminate use of pesticides

Small or marginal farmers at Bakshi Ka Talab, Lucknow were practicing intensive agricultural practices and not conscious about the deleterious effects of chemical pesticides and their spray application techniques. The farmers, both small holders and big farm holders, were concerned only in maximising their yields. The average farm size of the sample farmers was found ranging from 0.25 ha to 0.75 ha and vegetables were the major crops grown in the sample farms.

Knapsack spraying was used for spraying vegetable crops in this region. The farmers were unaware about the waiting period of pesticides, their lethal dose toxicity, persistency or package of practices of horticultural crops recommended by the agriculture department. It was observed that chemicals were applied without sufficient understanding of pest

habitat, economic injury level, pesticide chemistry, their quantities and application strategies. Out of 120 sample farmers, 46 (38%) farmers said that they had no source of information about safe pesticides use. They did not even read the labels on pesticides containers. Reuse of pesticide containers was also reported. According to many farmers (82%), they were faced with continuous reduction in their returns due to increase in inputs prices of their products due to damage caused by the insect-pests.

Frequency of pesticides application

In vegetables, pesticides were frequently used because pest infestation was relatively high in chillies, tomato, brinjal and okra. Harvesting of the vegetables (picking) was done once in 15 days in chillies, once in five days in brinjal and tomato and on alternate days in okra. As pesticide spray was done immediately before harvesting; no waiting period was observed. Since pest-free healthy produce fetched higher price in the market, frequency of pesticide spray was found more in the above four crops. Thus, the threat of pesticide residue on farm produce was more. Lack of data on pesticide exposure assessment is another limitation in this study. The pesticide application to okra crop was more than the other three crops. Farmers applied 6-18 pesticide applications for controlling borers (*Helicoverpa* spp, *Earias* spp and *Spodoptera* spp) in okra.

About 25.05 per cent of the farmers had an average of 13 or less sprayings, while 64 percent gave 14-18 sprayings to protect their produce from insect pests. Study revealed that 77.95 per cent of the farmers used more than 4 kg of active ingredient (a.i /ha) of technical grade insecticide.

In tomato, the number of application frequency ranged from 4 to 10 during the whole crop period. Majority of fields were found infected with fungal diseases, viz, *Fusarium* spp and *Alternaria* leaf spot, etc. About 68.31 per cent of tomato growers applied fungicides (Carbandazine, Thiram, Mancozeb, Sulfex and Bevastin) amounting to 2 kg or less of a.i/ha.

In brinjal, the frequency of insecticide spraying ranged from 10 to 13 to manage brinjal borer. The minimum range of pesticide-use quantity in brinjal was found to be 3-4 kg a.i/ha. The frequency of applications in chillies was found to be lowest (1-2 spraying).

The results clearly indicate that highest pesticide

application frequency was observed in okra followed by brinjal, tomato and chillies.

Types of pesticide used

The farmers at Bakshi ka Talab were using all the groups of pesticides including organophosphate, organochlorine, pyrethroids, bio-fungicides excluding bio-insecticides.

Most of the pesticides, Methyl Parathion, Dichlorvos, Carbofuron, Monocrotophos and Trizophos, used on the vegetable crops are categorised as extremely and highly hazardous chemicals by WHO recommended classification of pesticides by hazards, 2005 based on acute dermal LD50 for Rats. Endosulfan, which is now banned by the Central Insecticide Board, was frequently recommended by the local pesticide sellers and used by farmers.

Cypermethrin, Profenophos, Trizophos, and Chlorpyrifos were the most frequently used pesticides in okra and brinjal. Imidacloprid was found to be the most frequently and repeatedly used pesticide in chillies and cauliflower.

As the application frequency of chemicals increases, chances of more pesticide residues in vegetables increases. High application frequency in the field was solely responsible for the high alarming residue in our daily diet. The over reliance on synthetic insecticides for combatting pest complex in okra has created more pesticide allied problems in this area.

The findings of National Accreditation Board for testing and Calibration Laboratories (NABL) accredited pesticide residue testing laboratory, Pune which reported pesticides residues in vegetable samples (capsicum, potatoes, tomatoes, cucumber,

etc.) collected from market (upto 181 ppb level) which supported the present study.

Study conducted at Indian Institute of Toxicological Research, Lucknow on 20 vegetables including capsicum, okra, tomato, potato, etc. also revealed that pesticides such as HCH, Endosulfan, Dichlorvos, Permethrin, Malathion and Diazinon were detected from samples. In some vegetables like radish, cucumber, cauliflower, cabbage and okra, the detected pesticides were above maximum residues limit (PFA). Similarly, 100% vegetable samples from Kanpur, Lucknow and Allahabad were found to be contaminated.

Due to excessive use of insecticides, microbial control is limited in all the vegetable growing areas in kharif season. Hundred per cent mortality is recorded during kharif season in field collected larvae. In order to provide safe, economical and reliable alternative to chemicals, indigenous bio-control agents and their biology must be researched in the present context. There is need of in-depth farmers' training programme on integrated disease and insect management strategies in vegetables in these areas. The results found in the current study suggest a great deal of monitoring and immediate measures to address this issue with respect to economic and health perspective of the studied area.

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हमारी संस्कृति का प्रतीक—कमल

सुरेश चन्द्र शर्मा एवं पार्वती शर्मा

अनादि काल से कमल हमारी संस्कृति का प्रतीक रहा है। भारतीय साहित्य में कमल का जितना अधिक गुण गान किया गया है, उतना किसी अन्य पुष्प का नहीं। जलाशयों में गोलाकार तैरते पत्तों के बीच सूर्योदय के साथ खिलने वाला कमल फूलों में श्रेष्ठतम माना गया है। वास्तुशिल्पियों ने मन्दिरों, महलों व उद्यानों में सर्वत्र कमल को प्रधानता दी है। भारतीय संस्कृति का जहाँ-जहाँ प्रसार हुआ, उन सभी देशों विशेषकर चीन, जापान, कोरिया, इण्डोनेशिया, मलेशिया, भूटान, नेपाल, थाईलैण्ड, श्रीलंका व म्यानमार आदि में शताब्दियों से कमल एक सांस्कृतिक प्रतीक के रूप में प्रतिष्ठित है। परम्पराओं में कहा गया है कि विष्णु की नाभि से कमल उत्पन्न हुआ और उसमें से पद्मगर्भ ब्रम्हा उद्भूत हुए। इस सन्दर्भ में निम्न श्लोक स्मरणीय है— शांताकरं भुजगशयनं पद्मनाभं सुरेशं/ विश्वाधारं गगनसदृशं मेघवर्णं शुभांगम्/ लक्ष्मीकांतं कमलनयनं योगिभिर्ध्यानगम्यं/ वंदे विष्णु भवभयहरं सर्वलोकैकनाथम् ।।



कमल अवयवत जल और व्यक्त तेजस् तत्व पद्माक्ष सूर्य दोनों से जुड़ा हुआ है। कमल अव्यक्त से उत्पन्न होता है और व्यक्त की ऊष्मा से विकसित होता है। इसलिए कमल का हमारी साधनाओं में विशिष्ट स्थान है। शिव को भी पद्माक्ष कहते हैं। पद्मा लक्ष्मी के कई नाम कमल से व्युत्पन्न हैं। कमल संस्कृत के कम् शब्द से बना है। कम् का अर्थ है जल और अलं का अर्थ अलंकृत करना। अर्थात् जो जल को अलंकृत करता है, वह कमल है। इसकी पुष्टि इस श्लोक से होती है— पयसा कमलं कमलेन पयः, पयसा कमलेन विभाति सरः।

कमल का दूसरा पर्याय पद्म है। भारतीय मूल का कमल वास्तव में पद्म के नाम से ही विश्व में जाना जाता है। कमल की चड़ में जन्म लेता है और वहीं फूलता-फलता है। इसलिए इसे पंकज भी कहते हैं। कमल स्वयं को कीचड़ से पूरी तरह पृथक रखते हुए अपनी श्रेष्ठता बनाये रखता है। कमल पुष्पों को देवी-देवताओं का अर्पित करने की प्रथा आदिकाल से प्रचलित है। नवयौवना स्त्री की सुन्दरता का वर्णन कमल की सुन्दरता से की जाती है जैसे कमलनयनी, कमलमुखी आदि। अर्थात् कमल सौन्दर्य का प्रतीक है। तुलसीदास की निम्न पंक्तियां इस बात को बहुत अच्छी तरह उजागर करती हैं। यहाँ कमल का पर्याय कंज है— श्रीरामचन्द्र कृपालु भजमन हरण भवभयदारुणम्। नवकंजलोचन कंजमुख कर कंज पदकंजारुणम्।।

कमल का ऐतिहासिक महत्व भी है। सन् 1857 की क्रान्ति में कमल पुष्प व रोटी का प्रयोग क्रान्ति संदेश को दूरवर्ती क्षेत्रों में पहुँचाने हेतु किया गया था। भारत सरकार देश के विशिष्टतम व्यक्तियों का पद्मभूषण, पद्मविभूषण व पद्मश्री से अलंकृत करती है। सर्वश्रेष्ठ चलचित्र को स्वर्णकमल प्रदान करती है। हमारे राष्ट्रीय प्रतीक अशोक की लाट का शीर्ष चार सिंहां का चिन्ह पद्म पर ही अवस्थित है। कमल के बीजों में अंकुरण की क्षमता अद्भुत है। मंचूरिया में पुरातत्व अवशेषों की खुदाई में पाये गये बीजों से पता चलता है कि इसके बीज हजारों सालों के बाद भी भली प्रकार से उग सकते हैं तथा इनसे पौधे तैयार किये जा सकते हैं। इसलिए कमल को शाश्वत कहना सर्वथा उचित है।

परिचय : कमल (निलंबो नूसीफेरा) एक जलीय पौधा है। विश्व में इसकी दो प्रजातियाँ निलंबो नूसीफेरा तथा निलंबो यूटिया पाई जाती हैं। पहली एशिया की देशज प्रजाति है, जबकि दूसरी उत्तरी अमेरिका में पाई जाती है। इसके अतिरिक्त पूर्वी एशिया में कमल की अनेक रंग-बिरंगी किस्में मिलती हैं। भारत में कमल का पौधा कश्मीर से कन्याकुमारी तक पाया जाता है। देश के विभिन्न स्थानों में इसको अलग-अलग नामों से जाना जाता है। संस्कृत एवं बंगला में पद्म, गुजराती तथा मराठी में कमल, कश्मीरी में पैपूस, तमिल में तामरे और अंग्रेजी में इसे लोटस कहते हैं।

पौधे की संरचना : कमल एक बहुवर्षीय पौधा है जो प्रकन्द तथा एवं जड़ों की सहायता से मिट्टी में धंसा रहता है। पत्ते स्वतंत्रतापूर्वक जल की सतह पर तैरते रहते हैं। गहरे हरे से हल्के हरे रंग के इन पत्तों का व्यास 60 से 90 से.मी. तक होता है। इनकी सतह माम की पर्त के कारण चिकनी हाती है। वर्षा या सरोवर के पानी की कुछ बूँदें पत्तों पर मोतियों के रूप में ठहर जाती हैं, जो देखने में अत्यन्त चित्ताकर्षक लगती हैं। कमल का खिलना मार्च के अन्तिम सप्ताह से आरम्भ होता है और मई-जून तक जलाशय फूलों से भर जाते हैं। 10-30 से.मी. व्यास वाले ये फूल सफेद, गुलाबी, लाल व हल्के पीले रंग के होते हैं। वाहय दल हरे व संख्या में 4-5 तक होते हैं। कमल दल में पंखुड़ियों की संख्या 135 से 156 तक किस्मों के अनुसार हो सकती है। विभिन्न

किस्मों में दलों की संख्या एवं आकृति में भिन्नता होती है। कमल के फूल एक दल से लेकर बहुदलीय तक होते हैं। अनगिनत पुंकेसर अंडप (कार्पेल) के चारों ओर लगे रहते हैं। हल्के पीले रंग के बीजाण्ड अण्डप के स्पंजी ऊतक में धंसे रहते हैं। कमल तीन दिन तक खिलता रहता है। पहले दिन सुबह खिल कर अपराह्न में बन्द होता है। दूसरे दिन सुबह खिल कर सायंकाल बन्द होता है। तीसरे दिन सुबह खिलने पर बाहरी चक्र के पत्रदल गिरने शुरू हो जाते हैं। निषेचन के बाद पुष्पासन (टोरस) हल्के पीले रंग से हरा और फिर भूरा हो जाता है। एक पुष्पासन में 18 से 28 तक बीज होते हैं। हवा के झोंकों से बीज पानी में गिर जाते हैं। सितम्बर के महीने में फूल आने कम हो जाते हैं। नवम्बर माह में पत्ते सड़ने शुरू हो जाते हैं और मासान्त तक पत्ते पूरी तरह सड़-गल जाते हैं। कमल के पौधे का जीवन काल लगभग दो माह रहता है।

संवर्धन : कमल का संवर्धन इसके प्रकन्द और बीजों द्वारा होता है। अक्टूबर में प्रकन्द खुदाई के लिए तैयार हो जाते हैं। दो से तीन गाठों वाले प्रकन्द की फरवरी में रोपाई की जाती है। बीज द्वारा संवर्धन के लिए प्रति हेक्टेयर 10 कि.ग्रा. बीज की आवश्यकता होती है। बीजों को दोनों तरफ से घेर कर उन्हें पानी में रख कर अंकुरित कराते हैं। पौधों को दो पत्तियों की अवस्था में फरवरी-मार्च में रोपा जाता है। चीन व जापान में कमल की खेती धान की तरह की जाती है। अब भारत में भी पंजाब के कुछ भागों में इसकी खेती की जाने लगी है। कमल के पौधों को उगाने के लिए दो मीटर गहरे सूखे जलाशय में 50 से.मी. चिकनी मिट्टी की तह में प्रतिवर्ग मीटर पाँच कि.ग्रा. गोबर की खाद को मिलाकर सतह से 7.0 से.मी. ऊपर तक पानी भर देते हैं। तत्पश्चात कमल की दो पत्तियों वाली पौध को प्रतिरोपित करते हैं। पौधों को रोपते समय पानी का तापमान लगभग 25 डिग्री सेल्सियस होना चाहिए। कमल के एक पौधे को भली प्रकार फैलने के लिए 2 वर्ग मीटर का स्थान आवश्यक है। कमल के पौधों को 60 से.मी. व्यास और 50 से.मी. गहरी मिट्टी की नादों में भी उगाया जाता सकता है। नाद में 20 से.मी. तक चिकनी मिट्टी और गोबर की खाद 2:1 का मिश्रण बिछा देते हैं। तत्पश्चात पानी भर कर पौध या प्रकन्द को रोप देते हैं।

महत्व एवं उपयोग : कमल के प्रकन्दों को कमलकन्द, कमलककड़ी या भसीड़ भी कहा जाता है। एक हेक्टेयर क्षेत्रफल वाले जलाशय से 35-40 कुन्तल प्रकन्द प्राप्त होते हैं, जिससे 30-40 हजार रुपये तक का लाभ कमाया जा सकता है। यह भारतीय, चीनी व जापानी भोजन का अभिन्न अंग है। इसे सब्जी या अचार के रूप में भी खाया जाता है। प्रकन्दों की लम्बाई 60-112 से.मी. तथा व्यास 5-7 से.मी. तक होती है तथा इनका रंग सफेद, पीला या मटमैला होता है। ताजा प्रकन्द में 83.8 प्रतिशत जल, 9.25 प्रतिशत स्टार्च, 2.7 प्रतिशत प्रोटीन, 0.11 प्रतिशत शर्करा, 0.80 प्रतिशत रेशा, 1.10 प्रतिशत राख तथा 0.06 प्रतिशत कैल्शियम होते हैं। इसमें सूक्ष्म मात्रा में विटामिन भी पाये जाते हैं। कमल के बीज पौष्टिक, मधुर एवं शीतल होते हैं। कच्चे बीज खाये जाते हैं, जो बादाम की तरह सुस्वादु होते हैं। अधिक स्वाद के लिए इनको तल कर खाते हैं। कमल क प्रत्येक भाग में औषधीय गुण पाये जाते हैं जो निम्न श्लोक से स्पष्ट है— कमलं शीतलं वर्णं मधुरं कफपित्तजित्। तृष्णा दाहास्त्र विस्फोट विषवी सर्पनाशनम्।। अर्थात्, कमल शीतल, शरीर के रंग को निखारने वाला, मधुर, कफ-पित्तनाशक एवं तृष्णा, दाह, रक्तविकार और विष को दूर करने वाला होता है। कमल के फूल पूजा-अर्चना तथा साज-सज्जा में प्रयोग किये जाते हैं। इनका उपयोग रक्तपित्त, ज्वर, मूत्रकृच्छ्र एवं अतिसार में किया जाता है। कमल के पत्ते

भोजन परोसने के लिए थाली के रूप में काम आते हैं। नए पत्ते शीतल, तिक्त, कषाय रसयुक्त होते हैं तथा दाह, प्यास एवं रक्तपित्त को नष्ट करते हैं। प्रदूषित जल को शुद्ध करने में भी कमल की भूमिका है। कमल के पौधे पानी में घुले हानिकारक तत्वों को सोख लेते हैं।

संरक्षण : बढ़ती जनसंख्या, शहरीकरण, औद्योगीकरण एवं वन दोहन से पर्यावरण प्रदूषित हो रहा है। जलाशयों व पोखरों की संख्या लगातार कम होती जा रही है। पूर्वी उत्तर प्रदेश एवं बिहार के क्षेत्रों में कमल व मखाना जैसे महत्वपूर्ण जलीय पौधों का विनाश हो रहा है। अनेक प्रजातियों के पौधों स जहाँ जलाशय भर रहते थे वहाँ अब वह सूने दिखने लगे हैं। कमल के पौधों के संरक्षण की आवश्यकता को देखते हुए राष्ट्रीय वनस्पति अनुसंधान संस्थान, लखनऊ के वनस्पति उद्यान में कमल के संरक्षण के लिए

शोध एवं विकास कार्य किया जा रहा है। यहाँ एक कमल उद्यान बनाया गया है, जिसमें देश-विदेश की अनेक किस्में उगाई जा रही हैं। कमल की इन जातियों को संरक्षित करने के लिए इनके प्रकन्द एवं बीजों को दूसरे संस्थानों को भी वितरित किया जा रहा है। कमल पवित्रता, निर्मलता, कोमलता, निश्चलता, सर्जनता, अमरता एवं सौन्दर्य का प्रतीक है। प्राचीन काल से भारतीय परम्परा में इसी कारण कमल के पुष्प को विशेष स्थान दिया गया है। ऐसे में आजादी के बाद कमल को राष्ट्रीय पुष्प का स्थान देना सर्वथा उपयुक्त है।

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CGES Events

Third Foundation Day of CGES

Clean and Green Environmental Society (CGES) celebrated its Third Foundation Day on 8th July, 2018 by organizing a special function at CSIR-NBRI in which large number of guests including eminent scientists, academicians and social workers were present. On this occasion, Prof. Dhruv Sen Singh of Centre of Advanced Study in Geology, University of Lucknow delivered the Foundation Day lecture on the subject of 'Combat Climate Change' through clean and green environment. He said that climate change is one of the most challenging issues in the society. It involves many dimensions such as science, social science, moral and ethical values and affects our society. India is a country where about 70% of rural population depends on climate sensitive sectors (primary occupation) and natural resources (such as water, biodiversity, mangroves, coastal zones, forests, grasslands) for their livelihoods. Climate change is a global problem, felt on local scales that will be around for decades and centuries to come, Prof. Singh added.

Prof. Singh further said that combat climate change refers to efforts to reduce or prevent emission of



greenhouse gases. Mitigation can mean using new techniques and renewable sources, making older equipment more energy efficient, or changing management practices or consumer behaviour. The goal of combat/mitigation is to minimize the significant human interference in the natural cycle in a timeframe sufficient to allow ecosystems to adapt naturally to climate change in a sustainable manner. Prof. Singh told that the clean and green environment may be very useful technique to combat the impact of climate change on the society. Renewable resources will help India in mitigating climate change, through reduction in dependence on power generation by coal and mineral oil based power plants, which contribute heavily to greenhouse gas emissions, he added.

Presiding over the function, Mayor Smt. Sanyukta Bhatia praised the efforts of CGES in making people aware about saving the environment for their healthy life and called upon them to participate actively in making the city of Lucknow clean and green. She also released E-Newsletter of CGES on this occasion. Guest of honour Prof. S.K. Barik, Director, CSIR-NBRI also addressed the gathering. Prof. said that immediate efforts will have to be taken at all levels to make our surroundings clean and green and to protect the environment.

At the outset, Vice-President of CGES Prof. P.K. Seth welcomed the guests and said that CGES is committed to spread the message relating to environment protection among the people both in urban and rural areas. Secretary General of CGES Dr. S.C. Sharma made a presentation on the importance of vertical gardening and farming and said that such technique of planting ornamental plants will be useful in making the houses and offices green and environment friendly. Others who also spoke on the occasion included Dr. Virendra Nath, Treasurer, Prof. Yogesh K. Sharma, Joint Secretary of the society. Dr.

A.K. Singh, Organising Secretary, CGES proposed the vote of thanks.

Training on Making of Aagarbattis

CSIR-CIMAP with the support of CGES and Ma Chandrika Devi Mela Vikas Samiti organized a training programme on making of agarbattis (incense sticks) and cones using offered flowers at its women entrepreneurial training facility located near the temple on 9th September, 2018. The day-long programme organized under Aroma Mission of CSIR was attended by about 25 participants comprising members of CGES and other voluntary organizations and women from nearby villages. Dr. Alok Kalra, Chief Scientist from CSIR-CIMAP and Dr. R.K. Srivastava, Sr. Scientist conducted the programme. Er. Sumer Agarwal, President of CGES thanked CIMAP for arranging special training for the members and said that this technology of use of offered flowers can help in checking environmental pollution besides providing job opportunities to local people. Dr. S.C. Sharma, Secretary General, CGES, Dr. S.K. Singh, Asstt. Director, SIRD, BKT, Ms. Ruby Singh, Social Worker, Dr. A.K. Singh, Ex-Chief Scientist of CIMAP and Organising Secretary, CGES also addressed the participants.

LMA-CGES Joint Lecture on Floriculture

The Central and State Governments should encourage the farmers for the cultivation of the floricultural crops by providing loan at lower rates as these crops may enable the farmers to earn upto two to five lakhs rupees from an acre of land under the ideal conditions. These views were expressed by Dr. S.C. Sharma, former incharge, Botanical garden at NBRI in a lecture organised jointly by Lucknow Management Association (LMA) and Clean and Green Environmental Society (CGES) on April 27, 2019 at Levana Suites, Madan Mohan Malviya Marg, Lucknow. Dr. Sharma suggested that State Horticulture Departments should procure and provide latest ornamental varieties to the nursery men so that they can compete with the other countries. Dwelling at length about the importance of flowers in our daily life, Dr. Sharma said that these are associated with all the religions and rituals. He further said that floriculture is a highly lucrative business and global market is around 45 billion dollars while India's share is only one percent. Important floral crops are Roses, Orchids, Carnations, Gerberas, Alstomeria, Gladiolus, and Chrysanthemum. Dr. Sharma told that there are nearly 500 florist shops in Lucknow, where gladiolus spikes are available throughout the year. Best gladiolus spikes and corms are grown in Lucknow and the capital city of Uttar Pradesh is known as the Glad City.



Narrating the contributions of Lucknow CSIR labs in this area Dr. Sharma told that technology for the cultivation and marketing of the Gladiolus by the National Botanical Research Institute (NBRI) has helped the farmers to enhance the income from their marginal land. Flowers offered in the temples, dargahs, etc. are thrown in open and rivers. Scientists of the CSIR-CIMAP have developed the technology for making floral incense sticks and cones from such waste for offering in the temples.

The programme attended by about fifty participants was chaired by Dr. S.K. Barik, Director, CSIR-NBRI. Dr. Barik told that floriculture offers immense possibilities for job creation and CSIR-NBRI would be launching the Flower Mission soon to popularise improved technologies and plant varieties among the growers. Er. Sumer Agrawal, President, CGES also addressed the gathering. Shri A.K. Mathur, Vice-President of LMA proposed the vote of thanks. Others present on the occasion included Shri L.K. Jhujhunwala, Prof. Yogesh K. Sharma, Dr. Tariq Husain, Dr. A.K. Singh, Shri S.C. Shukla, Dr. Uma Shankar, Dr. M.P. Srivastava, among others.

बोन्साई प्रशिक्षण

सीजीईएस के तत्वावधान में 16 मार्च, 2019 को आयोजित एक दिवसीय निःशुल्क प्रशिक्षण में लगभग 30 प्रतिभागियों ने



विभिन्न पौधों जैसे बौगेनविलिया, बरगद, एडेनियम, इत्यादि के बोन्साई बनाने के बारे विस्तृत जानकारी प्राप्त की तथा उसकी विधिवत देखभाल के बारे में भी जाना। एनबीआरआई के पूर्व उद्यान प्रमुख तथा सीजीईएस के महासचिव डा. एस. सी. शर्मा ने बोन्साई की प्रयोगात्मक ट्रेनिंग देते हुये कहा की बागवानी बच्चों, वृद्ध जनों और युवाओं सभी के लिये एक उत्तम हॉबी ही नहीं बल्कि व्यायाम है। कार्यक्रम में सेवानिवृत्त कर्मचारी, वैज्ञानिक, समाजसेवी, शिक्षाविद, बागवानी में रुचि रखने वाले लोग एवं बड़ी संख्या में महिलायें उपस्थित थी। सीजीईएस के अध्यक्ष ई. सुमेर अग्रवाल ने प्रतिभागियों का स्वागत किया तथा प्रोफेसर योगेश के. शर्मा ने समिति के उद्देश्यों पर प्रकाश डाला। इस अवसर पर लॉरेन्स टेरेस क्षेत्र के एक सफाई कर्मी श्री अजय को उनके उत्कृष्ट कार्यों के लिये शाल भेंट कर सम्मानित किया गया। कार्यक्रम के अंत में डा. ए.के. सिंह ने धन्यवाद ज्ञापित किया।

NASI-CGES Awareness Programme on Environment and Biodiversity

Problems of environment pollution and loss of biodiversity are very grave in nature and mass awareness is needed to solicit people's participation for tackling them effectively. These were the general views expressed by the eminent scientists and experts in one day awareness programme jointly organised by CGES and NASI on 4th April, 2019 at Biotech Park, Kursi Road, Lucknow. Chief Guest of the inaugural session Prof. S.K. Barik, Director, CSIR-NBRI emphasised that though both are global problems, these can be solved by local people only. He further said that it is very necessary to make aware each and every individual of the society towards the protection of environment and biodiversity for better future.

The Technical Session was chaired by Prof. Veena Tandon, NASI Platinum Jubilee Scientist. NASI Senior Scientist Prof. P.K. Seth said that there are highly dangerous level of pollutants in ambient as well as household air today which are cause of severe health ailments. He said that pollution control measures may be costly but there are significant economic benefits associated to it. Professor Y.K.



Sharma, Botany Dept., LU in his lecture highlighted various aspects of environmental degradation and challenges to biodiversity in current era. He told that adopting sustainable system, new technology, recycling, establishing green belts etc. can mitigate the environmental problems.

Dr. S.C. Sharma, Secretary General of CGES spoke on the problem of indoor pollution and suggested that certain types of ornamental plants can solve this problem to great extent. Dr. A.K. Singh, Former Chief Scientist, CSIR-CIMAP delivered a talk on conservation of medicinal and aromatic plants. He said that conservation and cultivation of rare and endangered plants can generate additional employment opportunities and income to the farmers. CEO Biotech Park Prof. Pramod Tandon delivered his lecture on bio-economy and entrepreneurship and apprised the participants about the activities and services offered by Biotech Park.

Later, in an interactive session various questions raised by the students were answered by the experts. Other eminent scientists and guests who were present on the occasion included Er. Sumer Agarwal, President, CGES, Dr. V.P. Kamboj, Former Director, CSIR-CDRI, Dr. R.D. Tripathi, Emeritus Scientist, CSIR-NBRI, Dr. Suchitra Banerjee, NASI Senior Scientist and Secretary, NASI Lucknow Chapter, among others.

CGES Lecture on the Spices of India

Dr. S.C. Sharma, Former Scientist-Incharge, Botanical Garden, CSIR-NBRI and presently the Secretary General, Clean and Green Environmental Society (CGES) delivered a lecture on Indian spices in a function held on 25th May, 2019 at Levana Suites, Madan Mohan Malviya Marg, Lucknow. The function was presided over by the eminent cardiologist of the city Padm Shri Prof. Mansoor Hasan. In his lecture Dr. Sharma emphasised that because of combination of varying climates (tropical, sub-tropical and temperate the vegetation of India in Asian continent is unique. He told that India produces a variety of spices, many of which are native to the subcontinent, while others were imported from



similar climates and have since been cultivated locally for centuries. Some of the very common ones include-Turmeric, Coriander, Chilli, Black cardamom, Curry leaves, Garlic, Ginger, Fenugreek etc. Dr. Sharma added. Dr. Sharma further said that all ancient spices have medicinal properties along with its amazing flavour. He further told that Spices Board (Ministry of Commerce and Industry, Government of India) is the flagship organization for the development and worldwide promotion of Indian spices. Er. Sumer Agarwal, President, CGES welcomed the participants and said that India is also the largest consumer of spices given every Indian dish has some quantity of Indian spices. In the financial year 2016-17, India exported 947790 tonnes of spices that valued \$ 2.63 billion. Indian export of spices also registered about 6% growth on year to year basis in terms of value. Er. Agarwal further said that India exports most of its spices to United States, Vietnam, Sri Lanka, United Kingdom, United Arab Emirates, Saudi Arabia, Germany, Indonesia, China and Malaysia. Prof. Yogesh K. Sharma, Joint Secretary and Dr. Virendra Nath, Treasurer of CGES also addressed the participants. Dr. A.K. Singh,

Organising Secretary of CGES, proposed the vote of thanks.

Hands-on training on the Bonsai Culture at Palampur (H.P.)

Dr. S.C. Sharma, General Secretary, CGES gave a presentation and hands-on training on the Bonsai Culture at CSIR-IHBT, Palampur, Himachal Pradesh on 10th June, 2019. Mrs. Richa Mishra, wife of the Director, CSIR-IHBT presided over the program. Nearly fifty Staff and Ladies Club Members of CSIR-IHBT participated in the programme.



CGES in the Media

फूलों की खेती से बढ़ा सकते हैं आमदनी

लखनऊ। वैज्ञानिकों का कहना है कि फूलों की खेती से एक एकड़ क्षेत्रफल से ही हर साल दो से पांच लाख रुपये तक की कमाई हो सकती है। हालांकि, इसके साथ ही वैज्ञानिकों से सरकार से आर्थिक अनुदान और लखनऊ में प्रशिक्षण के लिए एक केंद्रीय व्यवस्था बनाने की जरूरत भी बताई है।

पूर्व वैज्ञानिकों की संस्था स्वच्छ, हरित पर्यावरण समिति (सीजीईएस) और लखनऊ मैनेजमेंट एसोसिएशन के संयुक्त कार्यक्रम में एनबीआरआई के पूर्व उद्यान अधिकारी डॉ. एससी शर्मा ने कहा कि फिलहाल फूलों की खेती के लिए जरूरी संसाधन मौजूद नहीं हैं। प्रदेश सरकार के बागवानी से जुड़े विभागों को भी नर्सरी में ऐसे पौधे उपलब्ध कराने चाहिए, जिससे कि किसानों को उत्पादन में सहूलियत हो सके। पूरी दुनिया की फूलों से होने वाली आय का सिर्फ एक प्रतिशत ही भारत से है। इसे बढ़ाने की कफ़ी संभावना है। लखनऊ को ग्लेडियोलस के उत्पादन के लिए जाना जाता है। इसे ग्लैड सिटी नाम ही दिया गया है। इसे और आगे बढ़ाया जाए। मंदिरों में चढ़ने वाले फूलों से अगरबत्ती और गुलाब जल बनाने का काम सीमैप के वैज्ञानिक बखूबी करा रहे हैं। कार्यक्रम में एके माथुर, सुमेर अग्रवाल, लक्ष्मीकांत झुनझुनवाला, डॉ. एके सिंह, डॉ. योगेश शर्मा, डॉ. एमपी श्रीवास्तव, एससी शुक्ला आदि मौजूद रहे। ब्यूरो

स्वच्छ, हरित पर्यावरण समिति के कार्यक्रम में विशेषज्ञों ने दी जानकारी

Public participation needed in environment protection: Experts

HT Correspondent
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LUCKNOW: Rise in environmental pollution and loss of biodiversity have become grave issues and mass awareness is needed to solicit people's participation for tackling them effectively.

These were the views expressed by eminent scientists and experts during one-day awareness programme held at the Biotech Park here on Thursday. Delivering lecture on the topic of environment and biodiversity, chief guest of the inaugural session Prof SK Barik, director, CSIR-NBRI said that though both are global problems, these could be solved by locals only. He further said it is necessary to make each and every individual aware towards the protection of environment and biodiversity for better future.

Sumer Agrawal, president CGES said that the society is committed to generate awareness towards environment and related areas through lectures, trainings, seminars etc. He pre-

sented the brief account of major activities carried out by CGES in the past. Prof Veena Tandon, a scientist, chaired the technical session. Senior scientist Prof PK Seth said there are highly dangerous levels of pollutants in the ambient as well as household air today which cause severe health ailments. He said pollution control measures may be costly but there are significant economic benefits associated with it.

Professor YK Sharma of botany department LU in his lecture highlighted various aspects of environmental degradation and challenges to biodiversity in current era. He told that adopting sustainable system, new technology, recycling, establishing green belts etc. can mitigate the environmental problems.

SC Sharma, secretary general of CGES spoke on the problem of indoor pollution and suggested that certain types of ornamental plants can solve this problem to a great extent. AK Singh, former chief scientist, CSIR-CIMAP delivered a talk on conservation of medicinal and aromatic plants.

करने का लक्ष्य रखा है।

घर के अंदर भी प्रदूषण से खतरा

लखनऊ। घर के बाहर ही नहीं अंदर भी प्रदूषण सेहत के लिए खतरा बन गया है। बृहस्पतिवार को वैज्ञानिकों की बायोटेक पार्क में हुई बैठक में यह मुद्दा उठा। वैज्ञानिकों का कहना है कि इससे निपटने के लिए स्थानीय स्तर पर ही प्रयास किए जाने चाहिए। पर्यावरण में बढ़ रहे प्रदूषण और जैव विविधता पर वैज्ञानिकों की एक बैठक बायोटेक पार्क में बुलाई गई थी। मुख्य अतिथि व एनबीआरआई के निदेशक डॉ. एसके बारिक ने कहा कि पूरा विश्व प्रदूषण की समस्या से जूझ रहे हैं। यह ऐसी समस्या है जिसका स्थानीय स्तर पर लोग खुद ही समाधान निकाल सकते हैं। पूर्व वैज्ञानिक डॉ. एससी शर्मा ने बताया कि घरों में उपयोग होने वाले सजावटी पौधों का सही चयन प्रदूषण से राहत दे सकता है।

पर्यावरण संरक्षण को जागरूकता जरूरी

जागरण संवाददाता, लखनऊ: पर्यावरण प्रदूषण और जैव विविधता के हो रहे नुकसान से निपटने के लिए लोगों की भागीदारी के लिए जनजागरूकता की आवश्यकता है। पर्यावरण और जैव विविधता पर आयोजित कार्यक्रम को



पर्यावरण संरक्षण संबोधित करते हुए एनबीआरआई के निदेशक प्रो. एसके बारिक ने कहा कि यद्यपि दोनों वैश्विक समस्याएं हैं, किंतु इन्हें स्थानीय लोगों द्वारा ही हल किया जा सकता है। बेहतर भविष्य के लिए पर्यावरण और जैव विविधता के संरक्षण की दिशा में समाज के प्रत्येक व्यक्ति को जागरूक करना बहुत आवश्यक है। प्रो. पीके सेठ ने कहा कि वायु में भी आज खतरनाक स्तर के प्रदूषक हैं जो गंभीर स्वास्थ्य बीमारियों का कारण बन रहे हैं।

औषधीय गुणों की खान हैं भारतीय मसाले

जासं, लखनऊ: भारतीय मसाले केवल स्वाद ही नहीं, औषधीय गुणों की भी खान हैं। क्लीन एंड ग्रीन एंवायरमेंट सोसायटी (सीजीएस) द्वारा मदन मोहन मालवीय मार्ग पर स्थित होटल में मसालों पर व्याख्यानमाला का आयोजन किया गया। एनबीआरआई के पूर्व उद्यान प्रभारी डॉ. एससी शर्मा ने भारतीय मसालों में विद्यमान औषधीय गुणों की जानकारी दी। समारोह की अध्यक्षता हृदय रोग विशेषज्ञ प्रो. मंसूर हसन ने की।

सीजीएस के अध्यक्ष इं. सुमेर अग्रवाल ने प्रतिभागियों का स्वागत किया और कहा कि भारत मसालों का सबसे बड़ा उपभोक्ता भी है। वित्त वर्ष 2016-17 में भारत ने 947790 टन मसालों का निर्यात किया जिसकी कीमत 2.63 बिलियन डॉलर थी। मसालों के भारतीय निर्यात में साल दर साल आधार पर छह फीसद की वृद्धि दर्ज की गई है। आगे कहा कि भारत अपने अधिकांश मसाले संयुक्त राज्य अमेरिका, वियतनाम, श्रीलंका, यूनाइटेड किंगडम, संयुक्त अरब अमीरात, सऊदी अरब, जर्मनी, इंडोनेशिया, चीन और मलेशिया में निर्यात करता है। सीजीएस के संयुक्त सचिव प्रो. योगेश के शर्मा और कोषाध्यक्ष डॉ. वीरेंद्र नाथ ने भी संबोधित किया।

Aims and Objective of CGES

Clean and Green Environmental Society (CGES) has been established as a vibrant body of professionals to promote the program for Clean and Green India to save the environment with the following aims and objectives:

1. CGES will act as a Think Tank to promote environmental education, diffusion of useful knowledge for the protection and preservation of the environment among the members, public, institutions.
2. Think Globally but act Nationally.
3. Care and Share the Nature.
4. To provide opportunity for better interaction among researchers, teachers, social workers, school children and NGOs on the environmental issues.
5. To generate awareness among the masses and policy makers for saving the environment.
6. To organize lectures of reputed professors and environmental scientists of India as well as abroad.
7. To hold seminars, conferences / symposia / workshops / training programs, focusing on the thrust areas of environmental awareness / issues at national and international levels.
8. To grant financial support to scientists / research workers for attending National / International seminars / symposia, conferences in India.
9. To award medals/certificates/honours to individuals/organizations who / which have achieved outstanding distinction in the area of environmental education, awareness, conservation of bio-diversity and research programs.
10. To honour outstanding environmentalists, life members of the CGES as 'Fellow of the Society'.
11. To publish Newsletter of the Society.
12. To address all such issues or matters as may be related to the protection, preservation etc. of the environment at the local, state, national or international levels
13. To provide consultancy services for the establishment and improvement of the Botanic Gardens, Arboreta, Parks, Herbal Garden, Green Belt, Construction of Urban Ecology etc.
14. To conduct training courses for the gardeners, supervisors, managers under the Skill Development Program of the Govt. of India and other such programs in Uttar Pradesh and other states.
15. To provide authentic information on the medicinal, economical, ornamental, pollution tolerant plants and their source of availability.

Forthcoming Events

National Conference

Clean and Green Environmental Society (CGES) will be organizing two days National Conference during February, 2020 in the CSIR-National Botanical Research Institute, Lucknow. The topic along with thematic areas to be covered in the National Conference and dates will be announced and published in due course of time in CGES website (cgesindia.org).

Plantation Drive

CGES will be undertaking planting of saplings in parks, schools etc. through involvement of local people and concerned management or authorities during August-September, 2019.

Training Programmes

CGES will be organising lectures-cum-awareness and training programmes for general public including garden lovers, home makers, students etc. on the various topics relating to environment, pollution control and cleanliness from August, 2019 onwards.

JHUNJHUNWALA GROUP OF INSTITUTION

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