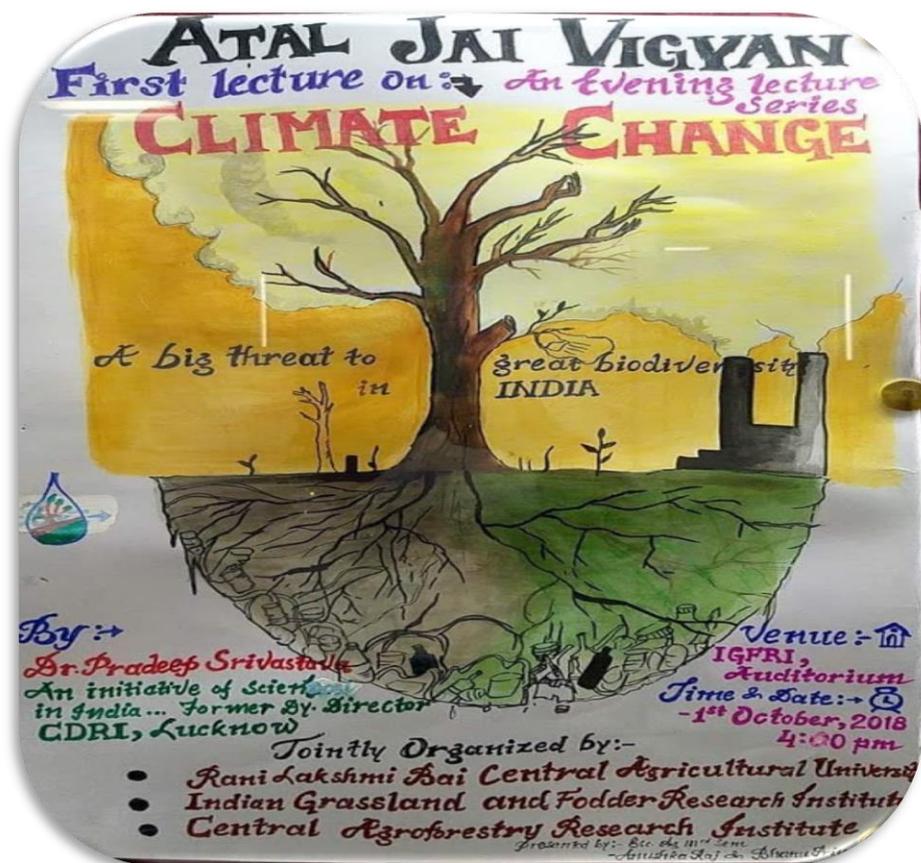


## ATAL JAI VIGYAN (AJV) Lecture series: Sharing wisdom and valuable thoughts with new generation

In order to give our heartfelt tribute to our former Prime Minister Sri Atal Bihari Bajpey Ji who raised 'Jai Vigyan' slogan along with Jai 'Jawan-Jai Kisan' realizing the importance of science & technology in every walk of life- be it defense, agriculture, biomedical and industrial development, RLBCAU has initiated "Atal Jai Vigyan" lecture series by eminent scientists, researchers and teachers for the benefits of students, faculty and as a part of development of quality human resources.



Climate change: A big threat to the great biodiversity of India



Forests and the People



Water Transport in Soil-Plants-Atmosphere



Vijay Singh T



Making of A Scientist



Plant Genetic Resources Management and Pre-Breeding in Genomics Era



Transforming Agriculture and Food System to Build a Zero hunger New India



Biodiversity, Ecosystem Services and Sustainable

Innovative Agriculture/Horticulture



## AJVL1

**Title & date:** “Climate change: A big threat to the great biodiversity of India” October 1, 2018

**Name of Speaker:** Dr. Pradeep Srivastava, Former Dy. Director, CSIR-Central Drug Research Institute, Lucknow, India, who is known for his tremendous contribution to popularise the science through “Scientoon”- a novel way to present science through cartoons and delivered > 1200 lectures in different parts of India and also in other countries.

**Summary of lecture:** Scientoons are the cartoons, based on science. They not only make you smile and laugh but also provide information about new researches, subjects, data & concepts in a simple, understandable and interesting thought provoking way. Scientoonics deals with effective science communication using science cartoons called scientoons. Scientoonics is a new branch of science that deals with effective science communication by using a novel class of science cartoons called scientoons. Dr. Pradeep Srivastava delivered a talk first by explaining very briefly about how I evolved a concept called scientoon and how it can be used for science communication. He spoke on from desert formation to deforestation to vehicular pollution in the cities and also focused on how encroachment is responsible for many environmental hazards including the accidents on the road. The main focus was that we can not stop new cars, motorcycles, scooters and other vehicles coming on the road which will contribute to global warming by causing vehicular pollution. So ultimately what best could be done. He suggested that the major work we need today is to plant trees as these are the best anti global warming machine produced by the nature. Trees like *Peepal* (maximum oxygen giving tree on the earth and one of the five trees planted in *Panchvati*, where Lord Ram, his brother Lakshman and Sita lived for 14 years) ). Air purifier *Neem, Pakar, Ashok, Bargad, Bel, Aonla* should be planted more in parks, colonies and public places. Through scientoons he also emphasized other small steps like sharing the cars, using mass transport; carefully using polythene can also make a change. He emphasized on persistent gender inequalities in nutrition that may dictate that male children are prioritized over female children in intra family care giving practices, food distribution and health care access and therefore have decreased risk of acute malnutrition. Thus, the females are also sufferers to cope up global warming.



## AJVL2

**Title & date:** “Forests and the People” December 8, 2018

**Name of Speaker:** Dr. S.P. Singh, Director, Amity School of Natural Resources and Sustainable Development and Amity Institute of Global Warming & Ecological Studies, Amity University Uttar Pradesh, Noida, UP, India. Dr Singh has expertise in the field of Biodiversity Conservation, Eco-development, and people participation in Natural Resources Management, GIS & Remote Sensing, and Climate Change & Carbon Assessment.

**Summary of lecture:** India is a densely populated country with high pressure on land and forest resources. The total geographical area of the country is 32, 87,240 km and it is the 7<sup>th</sup> largest country comprising 2.4 per cent of the world’s geographic area, and 1.8 per cent of its forests. Forests play a major role in supporting livelihood activities of the rural poor, contributing to the economy of India. Forests are also playing its role in mitigating the threat of Global warming besides conserving the fertile soil and vulnerable wildlife. Traditionally, timber has been the most important and valuable product of the forests. The other products called Minor Forest Produce (MFP) or Non Timber Forest Produce (NTFP) it includes bamboo, cane, fibre and flosses, leaves, oil seed resin, gum, essential oil, spices, honey, silk, lac etc. Tree grown outside forest in private lands, farm land and other non forest lands are contributing significantly to the total timber and fuel production. Dr. S. P. Singh while addressing the audience appraised about the production from such areas that has increased after the implementation of social forestry program in the country. The largest use of wood in India is in the form of firewood.



### **AJVL3:**

**Title & Date:** "Making of A Scientist" February 28, 2019

**Name of speaker:** Dr. Gursharn Randhawa, Former Professor & Head, Indian Institute of Technology, Roorkee .

#### **Summary of lecture:**

At the outset, Dr. G. S. Randhawa emphasized that Doctorate programmes play a major role in the making of scientists. A Ph. D. degree-holder is expected to be capable of doing research independently. Unfortunately the grooming during most of the Ph. D. programmes is not ideal. Generally, during grooming of a Ph. D. student in science subjects the emphasis is laid on learning a set of techniques in the chosen specialized area and generation of a large volume of data using these techniques. Many important aspects of the training of a Ph. D. student are given least attention or totally ignored. As a result, despite getting a Ph. D. degree and publishing of some research papers, a half-baked scientist is produced which gets little or no success in the subsequent professional career. During the making of a scientist, proper attention should be paid to the following aspects: desire, goal setting, determination, curiosity, keen observation, discipline, mentorship, oral expression, writing ability, analytical ability, awareness of strengths and weaknesses, creativity, leadership quality, human resource, planning, attitude, etc. The role of all these aspects in making a scientist was highlighted by Dr Randhawa in the lecture.



### **AJVL4:**

**Title & date:** "Transforming Agriculture and Food System to Build a Zero hunger New India" March 5, 2019

**Name of Speaker:** Padma Bhushan Dr. R B. Singh, Former Chancellor, CAU, Imphal and Ex President NAAS, New Delhi.

**Summary of lecture:** Ending Malnutrition by 2030 – Foremost Priority of India because of India's position is second in number of undernourished people after China in the world as suggested by Prof R. B. Singh. India has prevalence of vitamin A deficiency mostly occurred in pre-school children and pregnant women. Prime minister of India took pledge on 15 August 2017 to make Kuposhan Mukht bharat which will be free from malnutrition up to 2030. Besides of this world Global Zero Hunger Challenge Programme is also helpful in self sufficiency in food production by diversified farming in all parts of world where all essential food supplements can be provided to human beings from fruits, vegetables,

milk, fish, eggs, grains and others. Climate Smart Agriculture for Sustainable Nutrition Security and Science, Technology and Innovations for Nutritional Development also play an important role in food quality improvement and income generation by accepting various challenges of farmer's in India. India should have a vision of increasing productivity of 70%, reducing rural poverty as well as hunger up to 100% and also emissions up to 35%. Employing more than 50% of the people (nearly 700 m), accounting for 14% of GDP, and being almost three times more effective in alleviating hunger, poverty, and undernutrition, Agriculture matters the most in India. Thus, besides enhanced production, AFS should emphasize ecological efficiency, MLM, Save and Grow, environmental health, nutritional adequacy, inclusiveness, sustainability, and remunerative income (Doubling farmers income by 2022), Share & Grow are the highlights of Prof. R. B. Singh lecture delivered by him.



**AJVL5:**

**Title & date:** “Innovative Agriculture/Horticulture” March 18, 2019

**Name of Speaker:** Padma Shri Dr. Brahma Singh, Former Director, Life Sciences, DRDO HQ, New Delhi

**Summary of lecture:** Presently Indian horticulture production has historically increased partly due to adoption and development of several innovations namely - new crop varieties and hybrids, micro-irrigation, off season cultivation and innovative methods of production. Horticulture is emerging as breeding ground for innovations (a new idea, method, or device). While addressing the gathering, Dr Brahma Singh has remarked that horticulture being a vast subject is known to have continuous several innovations pertaining to seed/seedling/grafts/and other propagation material and methods improvement, their scientific multiplication, planting, crop production systems including minimization of water, fertilizer and other inputs, combating stress (bio and abiotic), harvesting techniques/tools and post-harvesting operations such as packaging, transport, shelf life extension, storage, cold chain, value addition and marketing. Dr Singh referred in general, top five innovations in horticulture globally are 1. Urban Agriculture, Smart Design, and Vertical Farms 2. The Drones and the Robot Bees-Pollinator 3. Artificial Intelligence, Internet of Things (IoT), and Automation- Driverless Tractor 4. Block Chain Technology and 5. CRISPR and Genetic Editing. Other innovations among fruit crops production such as high-density orchards, canopy management, innovative dwarfism, trellis training of fruit crops, biodegradable fruit covers in crops. Soilless cultivation of horticultural crops is another very important innovation, with a hope of potential future farming of horticulture especially urban horticulture. This innovation covers vertical beds/farming, aeroponic, aquaponics (fish and horticulture crops with same nutrients and water

inputs) and others which are gradually picking up in Indian horticulture also, already popular abroad. Besides sprouts, salads are now dominated by micro greens which have better nutritive and medicinal value, flavour and can be grown in every house round the year- an innovation. Agrivoltaic (production of solar photovoltaic power as well as crops on same piece of land) and perishable produce shelf-life extension, use of ICT in horticulture, e-garden, micro-gravity garden and blue chrysanthemum, innovative value addition in horticultural produces are some of the several innovations in horticulture. In nutshell, he has highlighted that innovative horticulture as future horticulture in India and abroad.



#### **AJVL6:**

**Title & date:** "Biodiversity, Ecosystem Services and Sustainable Agriculture" April 27, 2019

**Name of Speaker:** Dr N. K. Krishna Kumar, Former Deputy Director General (Horticulture) and Representative Asia, Biovarsity International, New Delhi

**Summary of lecture:** Biodiversity refers to the variety and variability of life on Earth. Biodiversity is typically a measure of variation at the genetic, species, and ecosystem level. Terrestrial biodiversity is usually greater near the equator, which is the result of the warm climate and high primary productivity while biovarsity refers to vvariability among living organisms. It includes diversity within and among species, Diversity within and among ecosystems. Biodiversity is the source of many ecosystem goods- Food, PGR, Changes in biodiversity can affect supply of ecosystem services. Biodiversity is foundation of diversity and food security. Considering the role of biodiversity in ssustainable agriculture, Dr N. K. Krishna Kumar suggested that “an integrated system of plant and animal production practices” that will over the long run enhance environmental quality and natural resource base (PGR) upon which the agricultural economy depends and it satisfies following four essential goals.



**AJVL7:**

**Title & date:** "Plant Genetic Resources Management and Pre-Breeding in Genomics Era" May 3, 2019

**Name of Speaker:** Dr. Kuldeep Singh, Director, NBPGR, New Delhi

**Summary of lecture:**

India is home of several agricultural crops including horticulture crops. Genetic resources are the basic raw material in its crop improvement programme. Their importance in improving agricultural productivity, improving the farmer's economic conditions and especially nutritional security is well recognized. They are valuable sources of important genetic traits needed for developing resilient and climate smart crop varieties and therefore, important for food security. Genetic resources include the traditional varieties, modern cultivars and crop wild relatives. Their use in gene introgression conferring biotic and abiotic resistance in crops can be dated back to > 60 years. In relation to major global challenges to food security like water and cultivable land, soil degradation, the situation demands attention to increase the productivity and resilience of current agricultural systems. Dr Kuldeep Singh highlighted that most of the crop wild relatives of cultivated crops across the world are not receiving adequate attention for their effective utilization in breeding programs. It is therefore, of utmost priority to protect them in the wild, through *in-situ* conservation, where they can continue to evolve and develop these useful adaptations. The germplasm is being conserved both under *in-situ* and *ex-situ* genebanks. The genetic material of plant origin of actual or potential value in the form of seed, vegetative propagule, tissue, cell, pollen, DNA molecule, etc. containing the functional unit of heredity that can be utilized in crop improvement by analysis of existing collections in genebanks and planned utilization, *In situ* conservation of native agro-ecosystems, wild crop relative habitats and Garden plots/ gene parks and experimental introductions as incubators of future biodiversity moulded by changing climate. Collectively it is need to unlock the GeneBanks to ensure food and nutrient security and environmental stability. In this lecture Dr Singh highlighted the significance of management and utilization of genetic resources in post genomic era for the development of new ideotypes possessing genes for better adaptation and higher nutritional value.



**AJVL8:**

**Title & date:** "Water Transport in Soil-Plants-Atmosphere Continuum" May 24<sup>th</sup>, 2019

**Name of Speaker:** Dr. V. S. Tomar, Vice Chancellor(s) , RVSKVV, Gwalior and JNKVV, Jabalpur

**Summary of lecture:** Water is made of two hydrogen atoms and one oxygen atom. Water has different structures in its various phases like snow, vapor and liquid. One water molecule combines with other one by hydrogen bond. Water is very important for life in the earth not only for survival of living things but also for dry matter production in plants. Water covers a large portion of plant body and it recycles from atmosphere to soil then plant and ultimately goes in atmosphere. Plants uptake water for not only metabolism but nutrition also. The SPAC is a dynamic system with the water potentials and flow rates varying with time and along the flow path from the soil to the atmosphere. The potential energy of water in the plant must be lower than that of soil-water to provide a gradient essential for the flow of water from the soil into and within the plant because of some water properties viz., Adhesion, cohesion, heat of vaporization, viscosity of water, its volume and density, surface tension, specific heat etc.

