Notes and News

Biofortification: A Gateway to Nutritional Security

Biofortification is an innovative and sustainable strategy aimed at addressing malnutrition by enhancing the nutritional quality of staple crops through breeding, genetic engineering or agronomic practices. It targets deficiencies of vital micronutrients such as iron, zinc and vitamin A, which affect billions of human populations worldwide, particularly in low- and middle-income countries where diets are dominated by calorie-dense but nutrient-poor staples like rice, wheat and maize. Unlike post-harvest food fortification (adding nutrients during processing), biofortification embeds nutrition into crops, ensuring benefits are inherent and can be reached even to the most marginalized populations.

Amongst the various techniques, Conventional Breeding involves selecting cross-breeding crop varieties which needs to be naturally rich in specific nutrients and it must be in the category of high-yield varieties. Advanced biotechnology enables the direct introduction of nutrient-enhancing genes into crops in case of Genetic Engineering. This approach is particularly useful for enhancing nutrients which are not naturally abundant in staple crops. The use of nutrient-enriched fertilizers or sprays during cultivation can enhance the nutrient content of crops, which is known as Agronomic Biofortification.

Biofortification primarily focuses on increasing the levels of following key nutrients which are commonly deficient in diets:

Vitamin A: Found in biofortified orange-fleshed sweet potatoes and Golden rice; Iron: Addressed through biofortified beans, rice and pearl millet; Zinc: Enhanced in rice, wheat and maize to support immunity and growth; Protein: Quality Protein Maize (QPM) improves the amino acid composition of traditional maize. Examples of some notable Biofortified crops include, Golden Rice: Engineered to combat vitamin A deficiency by acting as a source of beta-carotene (a precursor to Vitamin A) in Asia by reducing blindness in children; Iron-Rich Beans: Widely adopted in East Africa by reducing the occurrence of anemia; Pro-Vitamin A Sweet Potato: Distributed across Sub-Saharan Africa by addressing vitamin A deficiencies in rural areas; Zinc-Rich Wheat and Rice: Gaining attraction in South Asia by improving immunity and cognitive development.

There are many advantages of Biofortification. Biofortified crops are a long-term solution to malnutrition as they integrate nutrition into the food supply, requiring no ongoing interventions. After development, biofortified seeds do not add additional costs for farmers or consumers. By combating nutrient deficiencies, biofortification can reduce the prevalence of diseases like anemia, blindness and stunted growth.

There remain few challenges of Biofortification. Farmers may hesitate to adopt biofortified crops if they perceive lower yields or market value. Nutritional improvements may alter taste, colour or texture, affecting consumer preferences.

Organizations like HarvestPlus and CIMMYT (International Maize and Wheat Improvement Center) are at the forefront of biofortification. Successful implementations include zinc-enriched wheat in India and Pakistan, vitamin A-rich cassava in Nigeria and iron-fortified beans in Rwanda. Governments and international bodies are increasingly integrating biofortification into public health and agricultural policies to tackle malnutrition.

Biofortification represents a revolutionary approach to addressing global malnutrition sustainably. Despite challenges, its potential to transform lives, especially in resource-poor settings, makes it a vital component for the future agricultural and nutritional strategies. However, its success depends on overcoming technical, economic and social barriers to ensure wide-scale adoption and impact. ❐

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ISNA XXXVII Training Programme (Online): Certificate Course on Advanced Training on Science Communication and Media Practice for the 2024-2025

Indian Science News Association (ISNA) has recently launched a Certificate Course on Advanced Training on Science Communication and Media Practice for the 2024-2025 session. The inaugural ceremony for this programme was conducted online on 5th February, 2025.

The programme was graced by Dr. Saranjit Singh, Vice-Chancellor of KIIT, Bhubaneswar, Shri Sankar Bhadra, Chief Editor of Karmakshetra, Dr. K. Muraleedharan, President of ISNA, Prof. Manas Chakrabarty, Honorary Secretary, ISNA, Dr. Amit Krishna De, Honorary Secretary, ISNA and Convener of the Training Programme, and Shri Prasanta K. Bose, Chairman for the Training Programme along with other dignitaries. The online meeting was warmly attended by all current students, as well as former students and Coordinators. The event was anchored by Shri Saikat Kumar Basu, a former student of the training course of ISNA and a journalist.

Shri Amit Krishna De started the event by welcoming everyone. He briefly highlighted the importance of science communication in today's world and how modern digital tools can considerably boost science communication by allowing scientists to engage in a larger audience through interactive elements. Shri Prasanta K. Bose also expressed similar ideas. *"In today's world, it is absolutely important to learn the art of video making. It can make science communication extremely visually appealing and interactive."*, he explained. Prof. Manas Chakrabarty, however, focused on the need of traditional methods of science communication. Interestingly, there has been recent effort to combine scientific information with Patachitra, an ancient story-telling art form from Orissa. Students enrolled in this year's scientific communication programme were excited to explore this incredible interwoven world of science and art.

L to R: Mrs. Arpita Chakrabarty, Prof. Manas Chakrabarty, Dr. Amit Krishna De and Shri Saikat Kumar Basu

Shri Sankar Bhadra shared his experience as a journalist and science news writer. He briefly discussed how effective science communication influenced the lives of the fishermen in Digha, West Bengal. *"I hope the course will enable our students to create such positive impacts in our society"*, the mentioned. Dr. Saranjit Singh, Vice-Chancellor, KIIT also shared his views on the need of science communication. As a Vice-Chancellor of a modern University, he mentioned his willingness to conduct science communication workshops in his University. Dr. Saranjit offered to lend his skills and expertise from time to time to make the course more valuable to the students.

The last speaker of the day was Dr. K. Muraleedharan. *"The training programme is being successfully conducted for 37 years. That definitely proves its importance"*, he mentioned. He shared his optimism regarding the future of science communication in India. Additionally, he urged the students to fully engage in the programme's lectures and workshops that will be held during the next six weeks of the programme.

Finally, Vote of Thanks was delivered by Mrs. Arpita Chakraborty, one of the Coordinators of the programme.

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Release of Special Cover with Mystamp on Dr. U.N. Brahmachari

The Science Association of Bengal (SAB) on the closing ceremony of 150th Birth Anniversary of Dr. U.N. Brahmachari the renowned physician and scientist who discovered the medicine of 'Kalaazar' (Leismanasis) and saved lakhs of people from death. ln fact from 90% death rate, he brought down to under 10% death rare; and became globally acknowledged as an outstanding researcher. He received Knighthood and was twice refused Nobel Prize. He worked with monumental sincerity and dedication in the prestigious Nil Ratan Sarkar Medical College (Formerly Cambell School of Medicine). To pay respect to this great scientist and physician, SAB along with the active support of Dr. Brahmachari's family organized the Mystamp with cover of Dr. U. N. Brahmachari on 12th December, 2024 at the iconic GPO Auditorium Kolkata with great heritage since the Colonial times.

The programme started around 3 p.m. in the packed GPO auditorium by welcoming the audience, calling dignitaries to the dias; and followed by their individual felicitations by Dr. Kana Chaterjee (grand daughter of Dr. Bhramachari). The garlanding of the photo of Dr. Brahmachari was lead by Aloka Nanda Roy (great grand daughter of Dr. Bhramachari); and followed by dignitaries, guests, SAB members and public at large. The opening invocation was made by Dr. Rajib Karchowdhury; followed by the welcome address by Dr. Subhabrata Roychaudhuri, Secretary, SAB. The members of Governing Body of SAB under the leadership of Secretary, Dr. Roychaudhuri made a formal appeal to the authorities of the Govt. of India for honoring Dr. Brahmachari with coveted BHARAT RATNA Award posthumously for his monumental contribution towards global humanity. Dr. Roychaudhuri mentioned that such a great personality needs to be more known to public for his lifelong contributions and selfless, benevolent services for the public.

This was followed by series of lectures by the dignitaries, namely Prof. Dr. Pith Baran Chakraborty, (Principal, NRS Medical College & Hospital), Prof. Dr. Syamal Chakraborty (Professor of Chemistry, Calcutta University, author and eminent science communicator), Dr. Syamal Roy, FNA, CSIR (Retd.), Dr. Sankar Kumar Nath (Renowned Oncologist, author and public speaker). The speakers highlighted in various aspects of the inspiration life and research career and contributions of Dr. Brahmachari.

The release of Special Cover with Mystamp on Dr. U.N. Brahmachari was initiated by Mr. Ashok Kumar, the honourable Post Master General, Kolkata Region and Mr. Hammad Zafar, Director, GPO Kolkata. The dignitaries mentioned above and distinguished members of SAB and family members of Dr. Bhramachari. The Chief Guest of this beautiful program, Mr. Ashok Kumar, (PMG Kolkata Region) made an outstanding inspirational speech on the contributions of Dr. Brahmachari and how it has impacted both India and the world. The vote of thanks was delivered by Dr. N.C. Ghatak G.B. Member, SAB to finally conclude the program. ❐

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