

1984

It was not George Orwell's 1984. But this 1984 cannot and should not be forgotten by an average Indian. For, one of the worst industrial disasters in the history of mankind took place here in India and that too exactly 40 years ago that claimed more than 22,000 lives and had left millions behind maimed. The Bhopal gas disaster, caused by the leakage of a poisonous gas, Methyl Isocyanate (MIC) from the reservoir of a globally famous multinational company's chemical plant can be easily compared with the Chernobyl happenings or with the drop of the atom bomb at Hiroshima and Nagasaki in terms of its enormity. Strangely enough, when people are being reminded of the severity of the disaster through horrific graphics, the solar pond inside the perimeters of the plant filled up with chemical refuse is reported to be still emitting obnoxious gaseous particles in areas that surround the factory. There is no dearth of people in the lower stratum of the society in these surroundings and they are falling prey to the emission. Reports of these hapless people continuously getting afflicted with physical deformity, breathing distress or with skin ailments are common. A popular Bengali daily sent one of its reporters to this site to review what is happening in the place of occurrence 40 years after. The serialized breathtaking accounts pointed out that the story continues to be sad, one of human indifference.

That the U.S.-based corporation was lackadaisical in its operations from the very beginning was observed by many especially when safety aspects were concerned. According to Wikipedia, a well-known professor of environmental studies, an American Indian, attached to the University of California, Santa Cruz, had observed that the company "had participated in decades of previous instances of environmental negligence in every part of the world." The company's response to the Bhopal gas disaster, Prof. S. Ravi Rajan explained, was one of a "campaign of erasure." He then argued that this type of response "was to be expected according to the established cultural practices within large corporations."

There were many causative reasons behind the disaster as if it was bound to happen sooner than later. Before that

crucial night of December 2/3, 1984, a refrigeration system meant to cool tanks containing liquid MIC was shut down two years before. As a result, its high temperature set to sound at 11 degree C was disconnected and the storage tank temperatures ranged between 15 degree and 40 degree C, an invitation to a calamity. At the same time, a flare tower to burn the MIC as it escaped that had had a connecting pipe removed for maintenance was found to be "improperly sized." On the other hand, a vent gas scrubber, which was deactivated had "insufficient" caustic soda and "power to safely stop a leak of the magnitude produced." The result was horrendous. Within 45 minutes to an hour, about 30 tonnes of MIC escaped from the tank into the atmosphere. In two hours, the volume of the gas emanating from the tower rose to 40 tonnes. How much more lethal could it be? Ironically, the gases were blown in a southeast direction over Bhopal, the recorded accounts said. Two siren systems, one to alert people outside were found decoupled but only the factory people could flee in a safe direction.

After a series of acrimonious litigations that led to bail-outs and convictions of American and Indian industrialists and technocrats, reports of which were repeated both in national and international media, it was apparent that the Government of India was also not prepared to face the disaster of such a proportion. In the long run when the American company "had absolved itself of the situation," the Government of India was the "next institution that was looked to by the people of Bhopal." But, Prof. Rajan said, "the government's attempts at short and long-term plans failed in successfully aiding victims and instead created an opportunity...built largely at the expense of the victims." After these tortuous and eventful four decades when several analyses were done some basic questions still remain unanswered. Was there sufficient scientific research after the disaster? Is the government ready and equipped to face such a catastrophe, God forbid, if that happens again? Are contaminants still there in the air that will continue to affect generations of the future in the vicinity?

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## Acharya Jagadish Chandra Bose The Jewel Scientist Of British India Sudhendu Mandal

Indian Renaissance was a constructive interaction and a creative synthesis of the best of both worlds, i.e. East and West, within the canopy of Indian tradition and culture. Ram Mohan Roy was the torch bearer followed by Iswar Chandra Vidyasagar, Michael Madhusudan Datta, Bankim Chandra Chattopadhyay, Jagadish Chandra Bose, Rabindranath Tagore, Prafulla Chandra Ray, Asutosh Mukherjee and many others from all stages of Indian life, culture, religion, literature, and finally science. Acharya Jagadish Chandra belonged to the Jewel scientists of British India period. Jagadish Chandra changed the world through his

talents and innovative ideas. He has made significant contribution to the betterment of humankind during his time to have the identity of our own nation. His life is a role model for all persons who aspire to make a mark in the national/international context, and may achieve excellence in their own field of specialization. Acharya Sir Jagadish Chandra Bose, B.A. (University of Calcutta), B.A. (Cambridge) B.Sc., D.Sc. (University of London), CIE, CSI, FRS (30th November, 1858 to 23rd November, 1937) was a Bengali academician and a celebrated physicist,

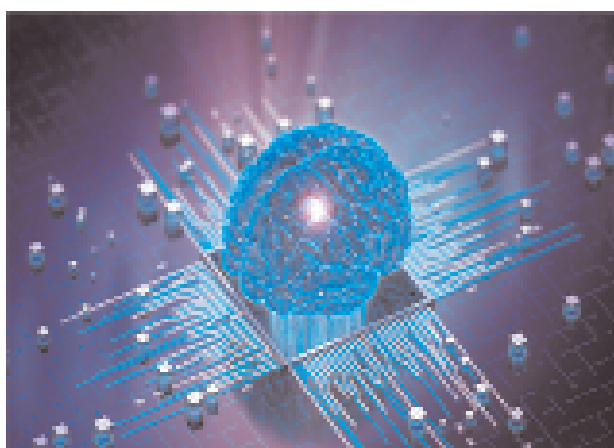
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## A Few Thoughts on AI Devaprasanna Sinha

The title could have been 'Artificial Intelligence at the Crossroads?'. That might raise eyebrows to many when the terms, abbreviated as AI, are around and in vogue with different connotations for the last two decades, though its genesis goes back to 1956 by John McCarthy with the development and usage of different software products similar to ex-

pert systems during those days. We have heard, studied and used terms like intelligent, intelligentsia, intellect, smart, even superintelligence, supersmart etc. in many disciplines. Without going much deeper into the various types of human intelligence, we have been generating and using AI applications, at times lustrous, coupled with almost all forms of machine intelligence



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## High Altitude Travel Sickness A Banker Recalls "Cold Desert" Tour Experience Prasanta K. Bose




His oxygen saturation level at that time was only showing 30. He was gasping for breath and feeling absolutely restless. Though he was made to lie on bed, he was huffing and puffing. People like us who rushed to his help were flabbergasted because everything seemed impossible and beyond reach at that ungodly hour at a height of +17,000 feet in Leigh, India's "Cold Desert," the exotic destination that draws tourists from all corners of the world every year.

"Who could have imagined that the pleasure trip of a tourist party from Kolkata would turn into a nightmare for one of our members," recounts Mr. Shankar Chakrabarty, an official of India's largest public sector bank, who is an avid

traveller despite having replaced both knee joints. Now 77, he has served in the bank for 40 years. His wife Krishna suffering from slipped disc pains always accompanies him. This time too, the call of Leigh and Ladakh in response to an invitation from a travel operator was hard to resist. "We have heard stories of high-altitude travel sickness but did not experience it before. No caution was sounded for us by the travel manager," the banker recalls. The victim, a retired government servant of 62, could, however, be saved when the hotel manager came to his rescue. Even though it was quite late in the night, a car meant for tourists could be arranged for transporting the victim to a nearby hospital. Doctors on duty immediately arranged for him transmission of oxygen intermittently to make him stable and keep him out of danger. "But that took him three days

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to be held on:

**31<sup>st</sup> February, 2025 (Wednesday) at 3.00 p.m. via Google Meet**

**Professor (Dr.) Saranjit Singh**  
Vice-Chancellor  
All India Institute of Industrial Technology, Madhavpur  
will grace the occasion as the Chief Guest

**Shri Sanjay Chandra**  
Chief Editor, Madhavpur  
will grace the occasion as the Guest of Honour

**Dr. R. Murugesan**  
President, ISNA  
Former Director, CSIR-ITRIL, Kolkata  
will provide the programme

**Prof. Manoj Chakrabarty**   **Dr. Anil Krishna Rao**   **Shri Prasanta K. Bose**  
(Madhavpur, ISNA)   (Tumkur, ISNA)   (Kolkata, ISNA)  
1000th Training Programme Science Communication and Media  
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and  
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Date: 28/01/2025  
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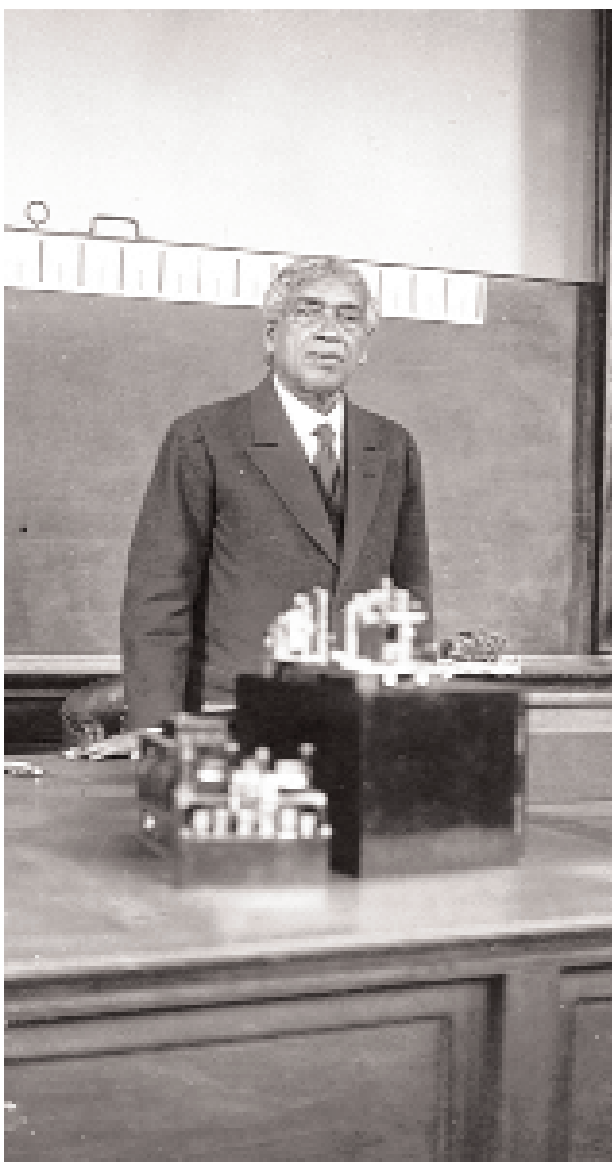


### 1>> The Jewel Scientist....

and concerned with all spheres of human interest. A great teacher, a true humanist and rationalist thinker, a world-famous scientist, a successful man of action, an ardent lover of his motherland, he was also a remarkable entrepreneur. As a professor, – a source of inspiration for the new generation - he was the President of the 14th session of the Indian Science Congress in 1927. The Father of Biophysics, Jagadish Chandra is regarded as the first scientist to produce, transmit and receive millimetre waves which are used for much of today's mass communication. He anticipated the first semiconductor, the seed of today's computer and electronic revolution. Proved by experimentation that both animals and plants share much in common, he demonstrated that plants are also sensitive to heat, cold, light, noise and various other external stimuli. Bose was the first Indian physics Professor at the Presidency College, and he was appointed by an order of Lord Ripon on his return from London.

He was the first professionally trained mainstream Indian scientist to be elected a Fellow of the prestigious Royal Society of London (FRS-1920). Sir Jagadish Chandra Bose was a Bengali polymath, physicist, biologist, biophysicist, botanist and archaeologist, and an early writer of science fiction.

Rabindranath and Jagadish Chandra were very close friends; both were in constant touch with



each other - a union of two minds – poetic and scientific. Jagadish Chandra always looked to Rabindranath for inspiration and guidance in moments of despair in his odyssey of scientific research at home and abroad. Being the Editor of Bangadarshan (1901-05), Rabindranath congratulated Jagadish Chandra for writing an article on a congratulatory poem - thematic of his research work titled “Jagadish” (1928) in his Book “Vana-bani.” Rabindranath was an active patron of scientific research. He arranged funds for Jagadish Chandra to establish the Bose Institute in 1917, a seed sown by Jagadish Chandra, which is now a big tree. The Basu Vignan Mandir in Kolkata is now a leading center of modern scientific research in India.

Acharya Jagadish Bose should be remembered and focused in a befitting way, following the ethos and culture of India, in the context of its progressive development for the present society. Now we are paying our respectful homage and tribute to Acharya Jagadish Bose (celebrating his 167th birth anniversary) for his significant contribution, and we are still amazed by his wealth of legacy that showed fame to India in the most significant way to proceed in the right direction.

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### 1>> AI...

with certain goals so as to become more intelligent than the normal or average human beings having human intelligence with different metrics.

Is it artificial or an extension or improvement of old intelligence? Is it something that is not natural? Is it replacing something in its entirety or complementing something?

Words like deep learning, deep intelligence do find their places in different disciplines. In recent times, I have come across terms like edge AI, where devices and IoT gadgets can handle AI tasks right where they are, locally. Real-time applications such as language translation and advanced vision processing are becoming more efficient and accessible with hardware like NPUs. Over these years, evolutions or revolutions in all fronts, digital transformation, human-less or human-assisted techniques are galore and had been, more or less, welcomed, not to speak of sustaining the businesses of all sizes to leverage those products effectively, necessitating the need of growing need of study, practice and research in those directions.

A lot of news is there. Indians are

very much there at all levels, whether they are entrepreneurs having start-ups or seasoned professionals. But where is the spread of science as news or news items at different levels in different media, more social these days? Is it only the discussion, if any, on the application or the sale and use of those products and their integration? Do we have any ethical consideration relating to digital divide in the appropriate usage of AI in all or identified areas? Will we have different metrics, quotients or the like for apparently known for different sets of people having intelligence?

It is known that Mathematics, Statistics, Data Science, Programming together with large data sets, data models do have intrinsically their methods of natural problem-solving methods that paved ways for new concepts, newer study and hitherto unexplored applications in a wide canvass.

The posers are still open. Much has been said, much remains to be told. Hence this small note to intrigue the readers and writers.

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### 1>> Cold Desert.....

when the oxygen saturation level had reached at least 80,” Chakrabarty says.

Being hospitalized he had no other option but to return to Kolkata via Delhi when an emergency air ticket had to be arranged for him by his daughter. It was clear that the victim, a chain smoker, had to miss the rest of the tour when the Chakrabarty's left for Nubra valley on way to Ladakh, “a place of sublime beauty.”

On being asked whether he did himself face any “health issue,” he remembers that at the Tso-Moriri Lake he climbed down a few steps to touch the chilled waters of the lake. But, he recalls, while clambering up “I felt I was choking for breath as the steps seemed to be yawning.” Concerned as his wife was, she was waiting for him counting the anxious moments. Thus was the danger of depleted oxygen level.

Chakrabarty remembers that one of his childhood pals, an academic with a history of heart ailments had faced a similar situation when he was travelling somewhere in the northeast's hilly terrains along with his wife. His friend did not take his personal physician's permission for travelling up in the hills. “Unfortunately, his wife this time fell a

victim of high-altitude sickness.” He is aware that there had been two recent instances of death of people going to Sandakhphu from Darjeeling without any medical advice. Both were young. The incident has sparked off wide reactions in the media and one of the most popular Bengali dailies has published a detailed article on dangers of high-altitude sickness for people with records of health emergencies. “It is good to know that there is an official thinking on clamping down some medical restrictions for people travelling high in the hills,” Chakrabarty remarks.

He has an advice for elderly people planning a trip to the hills. COPD, alcoholism, heart disease and smoking habits always pose a danger in the hills and one should not forget these signals. These days younger people are also getting vulnerable because of their life style and there is a note of caution for them too. Go to the hills but travel quietly, follow the restrictions, and avoid hard drinks and cigarettes. If these health problems are there, you will be straightway advised to go down and return to your place. “Hullabaloo in the hills is prohibited,” he reiterates.

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Professor (Mrs.) Asima Chatterjee was an outstanding research scientist and educationist - an icon for women scientists.

Asima Mukherjee was born in Kolkata on September 23, 1917 to Dr. Indranarayan Mukherjee and Mrs. Kamala Devi. She studied in Bethune Collegiate School, Bethune College, Scottish Church College (Honours in Chemistry, 1936). She obtained her M.Sc. degree in 1938 with Organic Special paper from University College of Science, University of Calcutta. She carried out research with Dr. Prafulla Kumar Bose, one of the pioneering researchers on Natural Products Chemistry in India.

She received the Nagarjuna Prize and Gold Medal (1940), Premchand Roychand Studentship (1942), Mouat Medal (1944). She was awarded the D.Sc. degree of the University of Calcutta in 1944 for her thesis entitled Naturally Occurring Indole Alkaloids and Coumarins. She was the first lady to obtain the D.Sc. degree of any Indian University.

In 1940 she joined Lady Brabourne College as Founder-Head of the Department of Chemistry. She was appointed Honorary Lecturer in Department of Chemistry, University of Calcutta in 1944. In 1945 she married Dr. Baradananda Chatterjee, FNA, a well-known Physical Chemist who was an authority on Soil Science and Corrosion. He was Professor and the Head of Department of Chemistry and Geology, Bengal Engineering College.

Prof. Asima Chatterjee worked with Professor L. M. Parks, University of Wisconsin, on naturally occurring glycosides (1947-1948); with Professor L Zechmeister, California Institute of Technology, on carotenoids and provitamin-A (1948-1949). She then worked with Professor Paul Karrer, NL, University of Zurich, Switzerland (1949-1950) on biologically active indole alkaloids which became her life-long interest.

Subsequently in the course of her long and illustrious career, she made

## Prof. Asima Chatterjee The Doyen Among Scientists Julie Banerji

several academic visits to several countries. In 1954 she was appointed Reader in the Department of Chemistry, University of Calcutta, then in 1962 Kumar Guruprasad Singh Khaira Professor of Chemistry, a Chair she held till her retirement in 1982.

Prof. Asima Chatterjee made significant contributions on the Chemistry of diverse classes of Natural Products from Indian medicinal plants, particularly in the fields of indole, isoquinoline and steroidal alkaloids and also on terpenoids and polyphenolics. She made substantial contributions to Synthetic Organic Chemistry and study of Organic Reaction Mechanisms. She published 355 research papers, and 20 reviews and book chapters. She contributed to the development of drugs based on the practice of Indian Traditional Medicine. She was the inspiration for the development of two Ayurvedic combination drugs – Ayush-56, a highly successful rehabilitation drug in the treatment of epilepsy and behavioural epileptic disorders, and Ayush-64, a highly potent antimalarial drug which was being used as an adjunct to standard care in mild to moderate COVID-19 cases. These are landmarks in the use of herbal medicines without any side effects.

She was the Founder of a multi-disciplinary Research Institute on Ayurvedic Sciences, now named the Central Ayurveda Research Institute, Ministry of Ayush, at Bidhannagar, Kolkata.

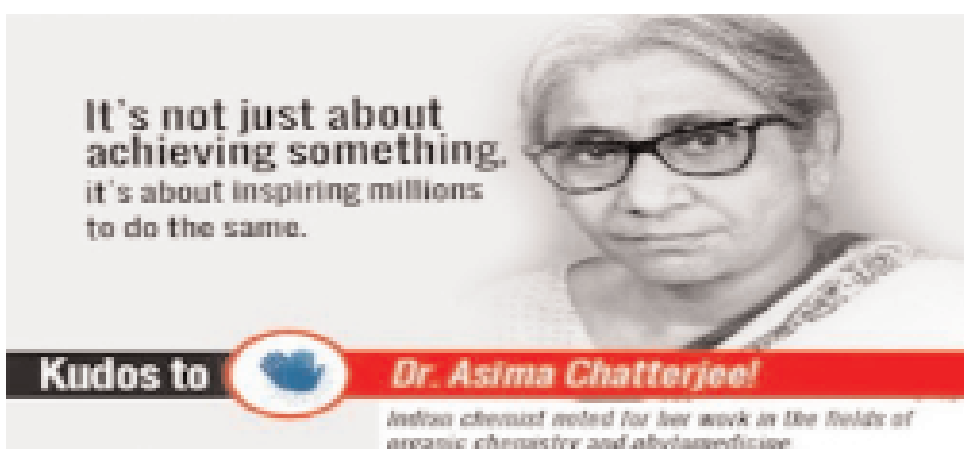
Prof. Asima Chatterjee created a school of Research on Natural Products. She guided 59 Ph.D. and three D.Sc. students. Several of her students rose to positions of eminence in the scientific community, establishing their own research schools in different Universities and Institutes – in India, Europe and America. She was the Chief Editor of the six-volume series, The Treatise of Indian Medicinal Plants, CSIR, India. She edited and revised the six-volume Bharatiya Bonousudhi, published by the University of Calcutta.

Among the many awards and recognitions she received, particular mention may be made of the following – Fellow of the Indian National Science Academy (FNA) in 1960; Shantiswarup Bhatnagar Award (1961); elected General President of Indian Science Congress Association (1975 Session) – the first woman scientist to receive this unique honour; honoured with the title ‘Padma Bhushan’ by the Government of India (1975); Asutosh Mookerjee Award (the highest ISCA Award, 1989). She was nominated Member of the Rajya Sabha (February 1982 – April 1984; May 1984 – May 1990) as a scientist-academician. During her tenure at the Rajya Sabha, she contributed significantly to science policy formulations. She was also deeply involved in the

popularization of science through Bangiya Bijnan Parishad.

She was a great devotee of Sri Ramakrishna Paramhamsadev, Holy Mother Sarada and Swami Vivekananda, and was closely associated with Ramakrishna Math and Mission, Belur, throughout her life.

Member,  
Organizing Committee,  
ISNA



## J.C. Kumarappa: A Pioneer of Green Economics and Organic Agriculture

Sudip Mandal

J.C. Kumarappa (1892-1960), a towering figure in India's economic and environmental movements, redefined the concept of development inspired by Mahatma Gandhi's ideals. He believed in a vision of progress where nature and humanity coexist in harmony. Kumarappa, often described as the architect of "Economy of Permanence," proposed an economic philosophy rooted in sustainability, where the preservation of nature formed the cornerstone of development.

During the pre-independence era, when the national leadership leaned towards Western industrialization, Kumarappa stood firm against it. He opposed the use of chemical fertilizers in agriculture, advocating instead for organic farming as the ideal path. Similarly, he preferred small-scale water management systems over large dams, as they were more sustainable and less disruptive to the environment and local communities.

His seminal book Economy of Permanence (1945) laid out a framework for sustainable development based on ecological harmony, emphasizing that economic practices should align with natural cycles and respect environmental limits.

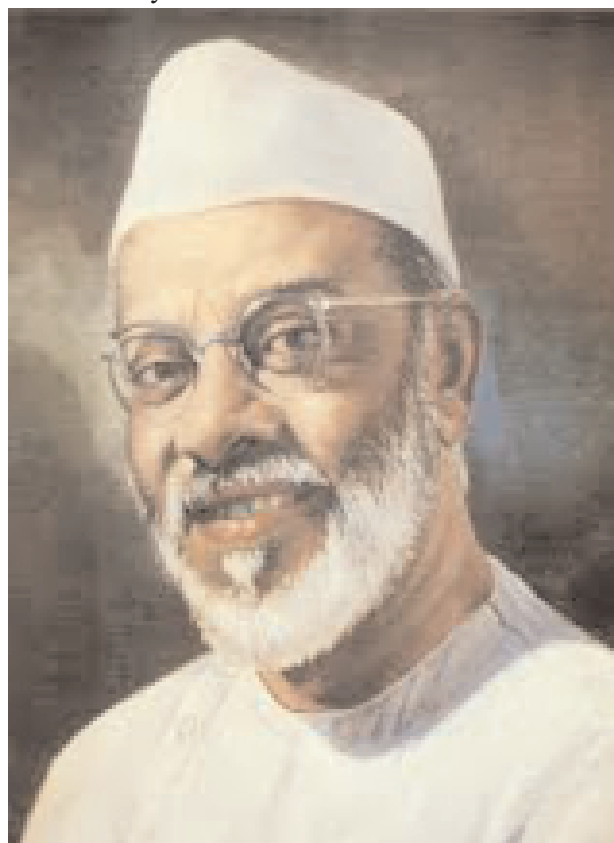
Kumarappa was not just an economist but also a dedicated environmentalist. His thoughts were deeply influenced by Gandhi's vision of Swaraj (self-rule), Swadeshi (self-reliance), and simple living. Gandhi was the guiding star of his life, illuminating the path that Kumarappa followed with unwavering faith.

J.C. Kumarappa's vision for agriculture was deeply rooted in the principles of sustainability and harmony with nature. At a time when industrial farming and large-scale infrastructure projects were gaining prominence, Kumarappa championed organic farming and small-scale agricultural practices as the foundation for rural development and ecological balance.

Kumarappa strongly opposed the use of chemical fertilizers in agriculture, which he believed disrupted the natural balance of the soil and led to long-term ecological damage. He argued that

farming should align with nature's processes rather than attempt to control or exploit them. Organic farming, according to him, was not merely a method of cultivation but a way to preserve the earth's fertility for future generations.

He believed that the reliance on chemical fertilizers and pesticides was a short-sighted approach that would ultimately harm both the environment and the health of the people. Instead, he promoted natural manure and organic methods as sustainable alternatives that could boost productivity without degrading the land. Kumarappa's support for organic farming stemmed from his broader philosophy of self-reliance and ecological integrity, which was deeply influenced by Mahatma Gandhi's ideals of simple living and sustainability.



Kumarappa was a vocal critic of large dam projects, which were often presented as symbols of progress and development. He believed that such projects disrupted local ecosystems, displaced communities, and prioritized industrial needs over the welfare of rural populations. Instead, he advocated for small-scale irrigation systems, like minor river dams and local water management projects, which were more sustainable and community-oriented.

To Kumarappa, large dams symbolized an exploitative relationship with nature, where the environment was seen merely as a resource to be dominated and controlled. He argued that smaller, decentralized solutions were better suited to India's rural landscape, as they could address local needs without causing significant ecological or social disruption.

Kumarappa's agricultural philosophy was centered around empowering rural communities. He emphasized the importance of small farmers having control over their land, water, and resources. He argued that large-scale industrial agriculture often marginalized small-scale farmers and created economic dependence on external systems.

By advocating for organic farming and opposing large dams, Kumarappa highlighted the need for an agricultural system that was in harmony with nature, supportive of rural livelihoods, and sustainable in the long term. His vision was a call to respect the earth, preserve its fertility, and recognize the interconnectedness of all life forms.

In today's world, where concerns about soil degradation, water scarcity, and climate change are becoming increasingly urgent, Kumarappa's ideas hold profound relevance. His emphasis on organic farming and small-scale solutions offers a path toward sustainable agriculture that respects both the environment and human communities.

Assistant Professor of History,  
Durgapur Womens' College

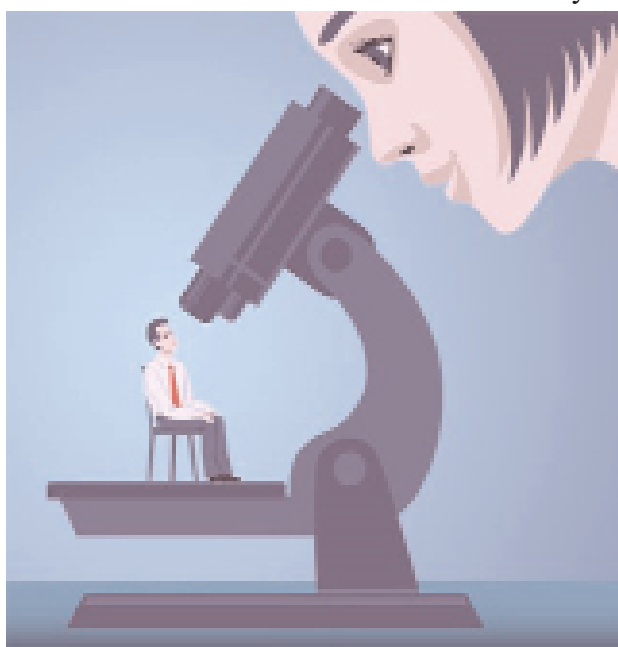


## Science learning and Scientific Tempers

Sabyasachi Chatterjee

Have you read that a couple sacrificed both of their daughters to the “almighty” with a belief that their daughters will come back in the Satya Yuga? What is most striking and disturbing in the whole news is the academic belongings of the couples. The couple, who believe that their daughters would get a new life after their death by offering to “God”, are science teachers. The father is teacher of chemistry who teaches in a college and the mother is a mathematics-teacher who teaches in a training college which trains the IIT-aspirants. They killed their daughters by throwing heavy object in their heads. The daughters were in their twens, i.e. they were of twenty years plus age.

This kind of heinous crime has been committed in Andhra Pradesh, just in the last month, i.e., January 2025.



The rift between science learning and scientific temper is not new at all. Hope you can easily remember the “incident” of feeding of milk by “Lord Ganesa”, which was held in September 21, 1995. Actually the rumour of feeding of milk by Ganesa was spread over India and abroad just like a forest-fire even before the coming of social media. The feeding of milk by the tongue of Ganesa was made possible through scientific method. The scientific theory of capillary action and surface tension was responsible behind the incident. Later, a research study exposed that many people who either spread the rumour or were affected by it, had the scientific knowledge of capillary action and surface tension. But that did not take them anywhere in the line of scientific thinking.

The pioneering figure of ISNA Acharya Prafulla Chandra Ray once lamented that he had taught his pupils regarding the science behind the mystery of solar eclipse and lunar eclipse but when that kind of eclipse took place the students followed the unscientific rituals connected to the eclipses following the old belief and orthodoxy.

Where should we go? How can we achieve the real scientific literacy which would help us to think scientifically? We have to find the answer now.

Professor of History,  
University of Kalyani.

## The Next Rakesh Sharma In Space!

Sibsankar Palit

The first Indian launched into Space was Wing Commander Rakesh Sharma. He flew aboard the Soviet Soyuz T-11 spacecraft on April 3, 1984. After around 40 years, India now is ready to send yet another Indian to Space, and this time to the International Space Station (ISS), in collaboration with the US. After Cosmonaut Sharma, Indian-origin astronauts like Kalpana Chawla flew to space in 1997 and 2003 but she lost her life on her way back to Earth. Sunita Williams made two successful missions on the ISS (2006 and 2012). In 2021, Raja Chari flew with the SpaceX Crew-3 and Sirisha Bandla became the first of the Indian origin to fly with the private space company, Virgin Galactic., India got her first Space tourist with the successful flight of Gopichand Thotakura on May 19, 2024. Sunita Williams also made her third flight to the ISS on June 5, 2024 but she is still stuck there due to problems with Boeing’s Starliner capsule.

India is gearing up to launch its ambitious ‘Gaganyaan’ mission, India’s first indigenously developed Human Space Flight program. Early this year the Indian astronaut-designates were announced. They included Group Captains: P Balakrishnan Nair, Ajit Krishnan, Angad Pratap, and Wing Commander Shubhanshu Shukla. Last year India signed the Artemis Accords (a non-binding space cooperation agreement on the Moon) with the U.S. and also collaborated with NASA to send an



Indian to the ISS, supporting its Gaganyaan program. Among the Gaganyaan crewmates, Captain Shukla has been selected to become the next Indian citizen to fly to space. He will become the first ever Indian to work on a Space station. As part of a collaboration with ISRO, he will serve as the prime mission pilot for the historic upcoming Axiom-4 mission to the ISS. His Gaganyaan crewmate, Group Captain Balakrishnan Nair will join him as a backup pilot, who will be considered for the spaceflight to the ISS in case there is any issue with Captain Shukla’s launch.

Captain Shukla from Uttar Pradesh, India, is an accomplished pilot in the Indian Air Force (IAF), with more than 2,000 hours of flight experience. As part of the ISS mission, Shukla will perform various experiments, adding to global scientific knowledge. Captain Shukla’s launch into space will be a step further in reinforcing India’s commitment to advancing its space capabilities inspiring the next generation of astronauts from India and other emerging nations.

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## U.N. Brahmachari Remembered

Special Stamp Released On 150th Birth Anniversary

Saikat Kumar Basu



The Science Association of Bengal (SAB), as part of the closing ceremony of the 150th birth anniversary of Dr. U.N. Brahmachari, renowned physician and scientist, who discovered the medicine of ‘Kalaazar’(Leishmaniasis) and saved lakhs of people from death, organized the “My Stamp” programme with a cover of Dr. Brahmachari at the iconic auditorium of the General Post Office (GPO), Kolkata on December 12 last year. Members of his family were present on this occasion.

Speakers at the programme recalled that it was in fact Dr. Brahmachari who brought down the 90% death rate to under 10% death rate through his phenomenal discovery, and thus became globally acknowledged as an outstanding researcher. He received Knighthood but was twice refused the Nobel Prize. He worked with monumental sincerity and dedication in the prestigious Nil Ratan Sarkar Medical College (formerly Campbell School of Medicine).

The programme, anchored by S. K. Basu, started around 3.00 pm in the packed auditorium. The dignitaries were welcomed and felicitated by Dr.

Kana Chatterjee (granddaughter of Dr. Brahmachari). Ms. Alokanda Roy (great granddaughter of Dr. Brahmachari) garlanded his photo on the dais. The opening invocation was made by Dr. Rajib Karchowdhury, followed by the welcome address by Dr. Subhobrata Roy Chowdhury, Secretary, SAB.

The members of governing body of SAB under the leadership of Dr. Roy Chowdhury made a formal appeal to the Union Government for honouring Dr. Brahmachari with the coveted Bharat Ratna award posthumously for his tremendous contribution. Dr. Roy Chowdhury stressed that such a great personality needed to be more known to public for his lifelong contribution and selfless, benevolent services.

This was followed by a series of lectures by the dignitaries, namely Prof. Dr. Pit Baran Chakraborty, (Principal, NRS Medical College & Hospital), Prof. Dr. Syamal Chakraborty (former distinguished professor of chemistry, Calcutta University, and eminent science communicator), Dr. Shyamal Roy, FNA, CSIR (retd.), and Dr. Sankar Kumar Nath (renowned oncologist and author). The speakers highlighted on various aspects of his life and research. The release of the special cover with My Stamp on Dr. Brahmachari was done by Mr. Ashok Kumar, Post Master General, Kolkata region, and Mr. Hammad Zafar, Director, GPO, Kolkata. The Chief Guest, Mr. Ashok Kumar, in his address referred to the contribution of Dr Brahmachari, and especially on how it has impacted both India and the world. Dr. N.C. Ghatak of the association delivered the vote of thanks.

Member,  
Organizing Committee,  
ISNA

## India Aspires To Become NZE By 2070

Amar Nath Bhadra

The Indian power sector has been fast changing and is expected to remain in the forefront of technological advancements to ensure continuing uninterrupted supply of power to 140 million people. Policymakers of our country have set a target to use new and innovative technology options like the advanced super critical technology (SCT) boiler in the power sector so that clean energy is delivered without degradation of the environment.

The power sector is facing several technical challenges to meet the set norms of pollution control and the utility sectors have been requested to urgently install equipment to check emission from the thermal power plants. But the progress is yet to gain the right momentum due to several technical reasons.

The Government of India has announced to hit net zero emissions (NZE) by the end of 2070 and has emphasized more renewable energy generation and phasing out sub critical boilers in order to reduce Greenhouse Gas emission.

According to this plan, about 10 million people are expected to be connected soon with rooftop solar

power plants and ground mounted power plants in the rural areas. By the end of 2030, fifty percent of power will be reached by non-fossil fuel-based energy resources to honour the commitments in the right perspective. The Indian power sector is fast changing after the G20 summit and several initiatives like the national hydrogen mission has been rolled out.

The major step for decarbonization of our country has been taken by all the stakeholders. India has so far installed 190 GW of renewable energy and its grid system becomes very much effective. India is committed to reducing its energy intensity by 45 percent by 2030 and the country is heading to the third largest economy by 2030.

The National Green Hydrogen project mission is seen to be deeply associated with the declared commitment of India to achieving the NZE goal and this is aimed towards creating energy security of the country. As India moves towards the RP (Renewable Power) investment is required to manage the transition and ensure an uninterrupted supply of power from different sources. There has been a visible impact of renewable energy in our country post Paris Agreement and 42.5% renewable energy (RE) is obtained from this source. The set target of achieving 500 GW of RE is our vision by 2030. This initiative will help meet solarization target and would contribute to reducing the carbon footprints. The use of Battery storage system is also gaining momentum and the use of lithium-ion battery is also a good option in the context of climate change and global warming.

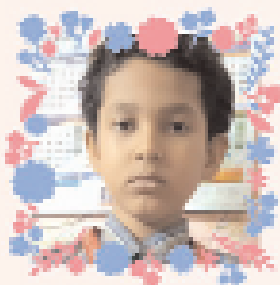
Former Student,  
ISNA



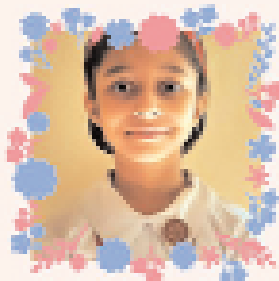
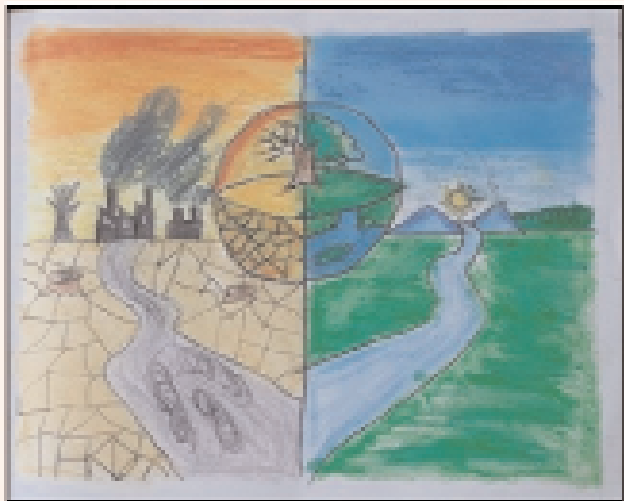
# Child Science



**RISHITA DAS**  
**CLASS - 3**  
**PATHA BHAVAN**



**Soujanya Banerjee**  
**Class- II**  
**Lions Culcutta Greater**  
**Vidya Mandir**

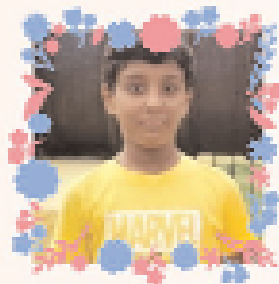
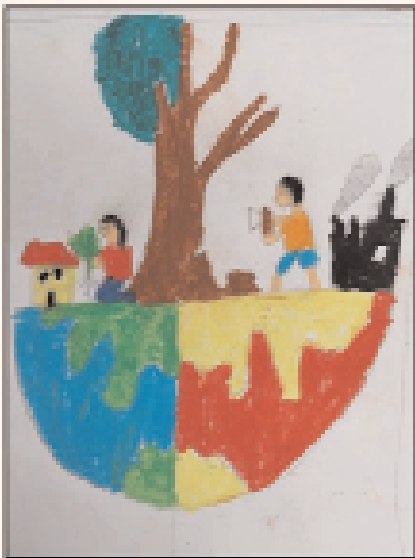


**Jahnabi Datta**  
**Class II**  
**Sister Nibedita**  
**Girls School**

## Tree Census By School Students

- Krishanu Bhattacharyya  
Former student, ISNA

There is no doubt that students must be made aware about the importance of trees in their life. To inculcate their interest in different types of trees around them, Kalyannagar Vidyapith, Khardaha in North 24 Parganas of West Bengal undertook a project for students of class VII of the school last September. In the initial stage, the students were introduced with different species and classification of trees in the classroom. Later they were given a printed form to survey in which the total number of trees in and around their houses must be collected along with their classifications. They were asked to identify each and every tree. The survey was done in the first week of September. In all,137 students participated in the project. They visited 692 households and worked among 3122 people. The areas covered by the students in the survey included 14 wards of Khardaha Municipality, six wards in Panihati Municipality, one ward in Barrackpore Municipality, and parts of Bandipur and Patulia Gram Panchayat. They identified 4391 trees. Out of them 34% were from shrubs species. About 22 % belonged to climbers while 26 % was identified as tree species. They found 37 climber types of trees. Among climbers, Gourd and Pumpkin were very popular. Among shrubs, 39 types of trees were identified. The most popular in this category were Hibiscus and Basil. The students found 23 types of trees. The most popular were Mango and Coconut. The students were asked to identify the trees with medicinal qualities and they could identify 13 medicinal plants. After analyzing the feedback from the students, it was found that the per head tree count stood at 1.5, which was higher in the rural households under the survey. But in some areas under municipal administration the number was lower than the overall average. Regarding tree plantation in the areas, the students had also collected some information which is not at all satisfactory in comparison with the increasing population pressure of the semi urban localities. This survey enabled the students know about the details and they had identified some trees which were not common. In apartments, home gardening was found to be popular and the students had identified some plants used as the medium of home decoration. The survey made the students interested in planting trees. The school has planned to repeat the survey next year too. The excitement and encouragement among the students created awareness of the people in general in the particular locality.



**RANAJOY DAS**  
**CLASS-3**  
**PATHA BHAVAN**



Conservation Of Wetlands  
Mouktik Sengupta

According to the US Environmental Protection Agency, “Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.” Wetlands are useful for any place or area as wetlands are crucial for maintaining environmental and biotic stability and contributes to various social, economic, and environmental factors.

Significance Of Wetlands

Wetlands are among the most productive ecosystems in the world, comparable to rain forests and coral reefs. Wetlands nurture an immense variety of species of plants, animals, insects, and other biotic animals. Climate, landscape, and geology shape the movement and abundance of water in the wetlands for housing the animals and insects. Wetlands are also called as “biological supermarkets” as they provide great volumes of food that attract many animal species. These animals use wetlands for part of or all their life-cycle.

Wetlands are also crucial as it helps in maintaining the ecological stability of an area or city. With a diverse aspect of animals and plants species it regulates the natural aspects of a city or an area. Wetlands provide values that no other ecosystem can. These include natural water quality improvement, flood protection, shoreline erosion control, opportunities for recreation and aesthetic appreciation and natural products for our use at no cost.

Wetlands are also important from an economic point of view as the use means a wealth of natural products



from wetlands, including fish and shellfish, timber, and wild rice. Some medicinal plants are also extracted from here. Especially in India, wetlands serve as a crucial source for the fishing industries and nearly half of the commercial catch is dependent on wetlands.

East Kolkata Wetlands

The East Kolkata Wetlands (officially known as East Calcutta Wetlands), are a complex of natural and human-made wetlands lying in the east of the city of Calcutta (Kolkata) in West Bengal, India. The wetlands cover 125 square kilometers and include territories of salt marshes, agricultural fields, sewage farms and settling ponds.

The East Kolkata Wetlands are crucial for Kolkata’s ecosystem as it serves many purposes such as sewage treatment of the city and the rich nutrients that it has helps in sustaining fishing and agricultural cultivation over there.

The East Kolkata wetlands are a rich source of flora and fauna with plant species such as Sagittariamontividenis, Cryptocoryneciliata and also fauna species like Silver carp and Tilapia. The area is also home to the marsh mongoose and the small Indian mongoose.

Conservation Of Wetlands

Wetland conservation is required to sustain the environment, and maintain the ecological balance with preserving the fauna and flora of that area. Some steps by the government should be taken such as developmental planning, management based on the prudent use strategies, promotion of ecotourism, and implementation of a regulatory framework which will enable the sustainability of the wetlands. In this time of global warming and rapid climate change, wetlands provide a strong ecological support for mankind. Hence, we must focus on the conservation of wetlands everywhere.

Former student, ISNA

Visceral leishmaniasis  
A Looming Global Threat  
Ritika Bandyopadhyay

Visceral leishmaniasis (VL), a significantly fatal vector-borne, rather underrated, tropical disease sits in 2nd place in mortality and in 7th place in loss of disability-adjusted life years among all tropical diseases. According to a report of the World Health Organization (WHO), in 2023, globally almost 50,000-90,000 new cases of VL were documented, where the fatality rate is over 95%, if it is not treated. This disease is endemic in over 70 countries and around 200 million people are estimated to be in danger. More than 90% of cases of VL in the world have been reported in seven tropical countries i.e., Brazil, Ethiopia, India, Kenya, Somalia, South Sudan, and Sudan. Eastern Mediterranean and European regions are also considered as endemic areas, where the number of cases is less than in other regions.

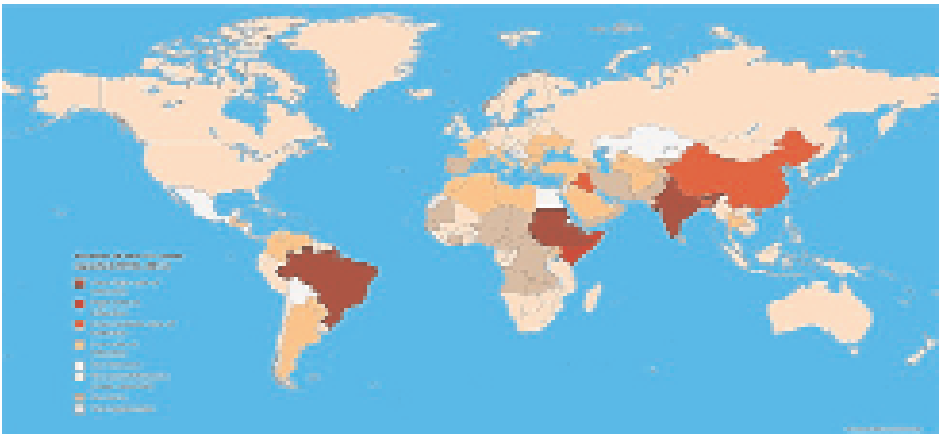
Leishmania sp. is the causative agents of VL or Kala-azar. As parasites migrate from the bite site to integral organs such as liver, spleen, and bone marrow, it is called visceral. The word ‘Kala’ is derived from Sanskrit, Assamese, Hindi, and Urdu, meaning black, and ‘azar’ meaning fever in Persian. Leishmania donovani causes the disease in all aged people in South-east Asia, particularly India, Bangladesh, Nepal, and Eastern Africa, especially Sudan, Ethiopia, Kenya, and Somalia where the reservoir is the

infected human and is transmitted anthropologically. Leishmania infantum mainly infects children aged below 10 years old in the Middle East, Afghanistan, Iran, Pakistan, and Brazil where the reservoir is dogs and other wild animals and is transmitted zoonotically.

Leishmania sp. has two hosts to complete their life cycle – one is an invertebrate host, the female sandfly, a hematophagous, noiseless, 2-3 mm. long arthropod, and another one is a vertebrate host, the mammalian host. However, this parasite needs a reservoir for transmission from one host to another.

Fever, weight loss, fatigue, haemolytic anaemia, enlargement of the spleen and liver, etc. are common symptoms of VL. Different conjugated lipid and protein biomolecules of Leishmania sp. like Lipophosphoglycan, glycoinositolphospholipids, proteophosphoglycan, 11 kDa kinetoplastid membrane proteins, glycoprotein 63, superoxide dismutase, trypanothione reductase, etc. are different virulence factors of Leishmania sp. that cause this disease in the host’s body and destroy the RBC of mammalian hosts and cause hemolytic anaemia.

Former Student, ISNA



Millets

The Story Of A Super Food  
Saikat Kumar Basu

Millets are a group of small-seeded grasses that are cultivated for their edible grains. They are highly nutritious and are considered ancient grains, with a long history of cultivation in many parts of the world, particularly in Asia and Africa. Millets are known for their resilience to harsh growing conditions, including drought and poor soils, making them a crucial crop in arid and semi-arid regions. There are several types of millets, including:

**Pearl Millet (Bajra):** One of the most widely grown types, especially in India and Africa.

**Finger Millet (Ragi):** Rich in calcium and widely consumed in southern India and parts of Africa.

**Foxtail Millet:** Common in East Asia, used for food and fodder.

**Sorghum (Jowar):** Sometimes included in the millet category; it’s a staple in parts of India and Africa. Proso Millet: Often used as bird feed but also consumed as food in some regions.

**Barnyard Millet:** Known for its high fibre content. Millets are gluten-free and rich in fibre, protein, vitamins, and minerals, making them an excellent choice for a balanced diet. They are particularly noted for their high levels of iron, calcium, and magnesium. Because of their health benefits and ability to grow in less-than-ideal agricultural conditions, millets are gaining popularity as a sustainable food source. Millets are hardy crops that can

be grown easily in a variety of environments, particularly in regions with semi-arid to arid climates.

Here are the conditions and regions where millets grow well:

**1. Climate Drought-Prone Areas:** Millets are highly drought-resistant and thrive in areas with low rainfall, typically between 200 to 600 mm per year.

**Temperature:** They prefer warm climates, with optimal growing temperatures ranging from 20°C to 30°C.

**2. Soil Well-Drained Soils:** Millets can grow in poor soils, but they do best in well-drained, sandy, or loamy soils with a pH range of 5.5 to 7.5.

**Low Fertility Requirements:** Millets can tolerate and even thrive in soils with low fertility, making them suitable for marginal lands.

**3. Regions Africa:** Particularly in countries like Nigeria, Niger, Mali, and Sudan. India: Especially in semi-arid regions like Rajasthan, Maharashtra, Karnataka, and Andhra Pradesh.

**China:** In the northern and northwestern regions.

**Southeast Asia:** Parts of Myanmar, Thailand, and Vietnam.

**United States:** In the dry, central regions such as Nebraska, Colorado, and South Dakota.

**4. Growing Season Short Growing Period:** Millets have a short growing season, typically maturing within 70-90 days.

7>>

‘Her Earth, Her Voice’  
Women’s Role In Environmental Stewardship’  
Jhilike Saha

Women have long been at the forefront of environmental stewardship, often embodying a deep connection with nature and its preservation. Historically, women’s roles as caregivers and resource managers have intertwined with their environmental contributions, especially in rural and indigenous communities where they manage essential resources like water, fuel, and food. This close relationship has fostered a unique perspective on sustainability, making women indispensable in addressing environmental challenges.

The modern environmental movement has been amplified by women’s voices, with figures like Rachel Carson, Wangari Maathai, and Greta Thunberg inspiring global action. Carson’s seminal work, Silent Spring, spurred awareness of the dangers of pesticides, while Maathai’s Green Belt Movement in Kenya empowered women to plant millions of trees, combat deforestation, and advocate for social justice. Thunberg, a symbol of youth-led activism, has mobilized millions worldwide, highlighting the urgency of climate change.

Women’s leadership in environmental stewardship is not limited to advocacy but extends to grassroots initiatives. In India, the Chipko Movement demonstrated the power of women in protecting forests, with local women hugging trees to prevent

logging.

Similarly, women in Bangladesh have led initiatives in sustainable farming and disaster resilience, highlighting their innovative approaches to environmental challenges.

However, despite their significant contributions, women often face systemic barriers such as limited access to education, resources, and decision-making platforms. Gender inequality hinders their potential to lead environmental change fully. Addressing these disparities is crucial for achieving global sustainability goals, as gender equality and environmental stewardship are inherently interconnected. Empowering women through education, training, and inclusive policies enhances their ability to influence environmental outcomes. By recognizing women as equal partners in stewardship, societies can harness their unique insights and leadership. Their voices are essential in building a more sustainable and equitable future, where both humanity and nature can thrive. Women are not just victims of environmental degradation; they are resilient leaders and visionaries, shaping a harmonious relationship between humanity and the planet. In empowering their voices, we empower the Earth itself.

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Science Communication and Media Practice  
Valedictory Session Of 37th Training Programme  
-Sibsankar Palit

The Indian Science News Association (ISNA) hosted the Certificate Award Ceremony for the XXXVII Training Programme on Science Communication and Media Practice on September 30, 2024. This was the valedictory session for all the students and resource people associated with the 6-week online certificate course on basic science communication and media practice. The online ceremony marked the launch of the Bengali e-paper 'Bigyan Kahan' (volume 3, issue 2), a publication of the ISNA for dissemination of scientific knowledge and dialogue.

The session was graced by the Chief Guest, Mr. Biswajit Matilal, Vice-President (Corporate Communication) at Birla Corporation Limited and a former senior journalist with The Statesman. His presence emphasized the importance of science communication in media in this information era, especially at a rapid rate of change. The session was hosted by ISNA alumni, Urbi Rai and Tritisha Das and was headed by Dr. K. Muraleedharan, President of ISNA, and former Director of CSIR-CGCRI, Kolkata, India.

Dr. Muraleedharan ensured all that both the scientific and communication aspects of the meeting were guided by able hands. The program started with a Welcome Address by Mr. Prasanta K. Bose, Chairman of the 37th Training Programme who warmly welcomed all the participants and guests. He was succeeded by Prof. Manas Chakrabarty, honorary secretary of ISNA who mentioned about the success of the participants and their training in furthering science communication. This culminated in the declaration of results of the Training Programme by Dr. Amit Krishna De, Convener and ISNA honorary secretary. Everyone applauded the efforts put into this training on the part of participants who completed their training successfully. Recognition of such efforts was bound to be individualistic but indeed reflected the commitment of the ISNA towards excellence in science communication.

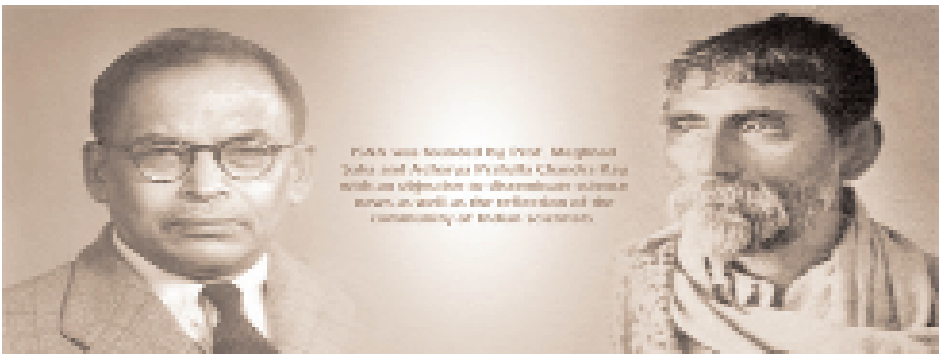
Finally, it was time for the official launch of the Bengali e-paper 'Bigyan Kahan'. The e-paper continued to be a very effective medium through which scientific insights were disseminated and science was popularized. Chief Guest, Mr. Matilal shared with the audience his valuable experience in corporate communication and journalism. He said how proper

media practices could bridge the gaps between scientific communities and the public. Mr. Matilal found the naming of the Bengali e-paper 'Bigyan Kahan' quite fascinating and befitting and appreciated such efforts on the part of editors and contributors.

As part of the ceremony, Dr. Muraleedharan in his address expressed his views on this vital branch of science communication along with its importance to modern society and encouraged the participants to make field-specific application with renewed vigour and commitment. The closing event took place with Prof. Prabir Kumar Saha, honorary Treasurer of ISNA who concluded the event with a vote of thanks.

The participants who attended the training program spoke on their engagement and interest during the learning journey. This was a very significant milestone for participants and reinforced the role of ISNA in science communication as an essential discipline for societal advancement. ISNA aimed to enhance public engagement with science by equipping people with the necessary skill set, thereby fostering a more informed society capable of making educated decisions based on scientific understanding.

In a nutshell, the valedictory ceremony was a crucial event because it was not just a recognition ceremony but an example of how ISNA has continued to show dedication to fostering talent in science communication and media practice for the foreseeable future, everyone felt.



Student of the 37th Training Programme, ISNA

7...Millets....

70-100 days, which makes them suitable for regions with short rainy seasons.

Overall, millets are versatile and can be grown in areas where other staple crops might struggle, making them an important crop for food security in challenging climates. Growing millets successfully requires attention to several agronomic parameters, which can significantly impact yield and quality. Here are the key factors:

1. Climate

Temperature: Millets are generally warm-season crops that thrive in temperatures between 25°C to 32°C (77°F to 89.6°F). They can tolerate higher temperatures but are sensitive to frost.

Rainfall: Millets are drought-tolerant crops. They require 400-700 mm of rainfall annually, depending on the specific millet variety. However, excess rainfall can negatively affect growth.

2. Soil

Type: Millets grow well in a variety of soils, including sandy, loamy, and clay soils, but they perform best in well-drained, fertile, and slightly acidic soils (pH 5.5 to 7.5).

Fertility: Though millets can grow in less fertile soils, they respond well to the application of organic matter and balanced fertilizers, especially nitrogen, phosphorus, and potassium.

3. Sowing

Time: The optimal sowing time for millets varies with the region but is generally during the onset of the rainy season.

Seed Rate: The seed rate depends on the millet variety but generally ranges from 4 to 10 kg per hectare.

Spacing: Row spacing typically ranges from 25 to 45 cm, with plant spacing of about 10 to 15 cm within rows.

4. Irrigation

While millets are drought-resistant and can grow under rainfed conditions, supplementary irrigation during critical growth stages (e.g., flowering and grain filling) can enhance yields. Over-irrigation should be avoided as it can lead to waterlogging, which is detrimental to millets.

5. Weed Management

Weeds can significantly affect millet growth, especially in the early stages. Timely weeding or the use of pre-emergence herbicides can help manage weeds. Mulching can also be effective in controlling weeds and conserving soil moisture.

6. Nutrient Management

Balanced fertilization is crucial. Nitrogen is particularly important, but phosphorus and potassium also play vital roles. Organic fertilizers or green manuring can improve soil health and millet productivity.

7. Pest and Disease Management

Millets are generally less susceptible to pests and diseases compared to other cereals, but they can still be affected by pests like shoot flies, stem borers, and diseases like downy mildew and smut. Integrated Pest Management (IPM) strategies, including crop rotation and bio-

logical control, are recommended.

8. Harvesting

Harvesting is usually done when the grains are mature and hard, and the moisture content is around 20%. Timely harvesting is crucial to avoid shattering losses.

9. Post-Harvest Handling

Threshing should be done carefully to avoid grain damage. Proper drying to reduce grain moisture to 12-14% is essential to prevent spoilage during storage. By carefully managing these parameters, farmers can optimize the growth and yield of millets in various agroclimatic conditions.

Millets are versatile grains with a variety of commercial uses across different industries. Here are some of the key commercial applications:

Food Industry:

Baked Goods: Millets are used in the production of gluten-free bread, cookies, and cakes. They provide a nutritious alternative to wheat.

Cereals: Millet-based breakfast cereals, flakes, and granola are popular for their health benefits.

Snacks: Millets are used in the production of healthy snacks like chips, crackers, and energy bars.

Beverages: Millet can be used to produce non-alcoholic beverages like millet-based smoothies, and porridge drinks, and is sometimes fermented to produce alcoholic beverages.

Animal Feed: Millets are used as a feed ingredient for poultry, cattle, and other livestock. They provide essen-



tial nutrients and are particularly useful in regions with low water availability.

Biofuels: Millets, particularly certain varieties, are explored for biofuel production due to their high biomass yield and adaptability to marginal soils.

Pharmaceuticals and Nutraceuticals: Millet extracts are used in the production of dietary supplements due to their high fibre, protein, and antioxidant content. They are also investigated for their potential in managing diabetes and cardiovascular diseases.

Cosmetics: Millet is used in the cosmetic industry for skincare products due to its antioxidant properties and ability to improve skin health.

Craft Brewing: Millets are increasingly used in the brewing industry to produce gluten-free beers and spirits, appealing to consumers with gluten intolerance.

Pet Food: Millet is an ingredient in some premium pet foods, especially for birds and exotic pets, due to its high nutritional value.

Textiles: Millet straw is sometimes used in making traditional crafts, paper, and even in biodegradable packaging materials.

These diverse uses highlight the growing significance of millets in various commercial sectors, driven by increasing demand for sustainable and healthy products.

Millets are hardy crops that can grow in various conditions, but they thrive particularly well in semi-arid to dry regions with well-drained soils. In West Bengal, the most suitable areas for growing millets include:

Purulia: This district has dry, upland areas with lateritic soils, making it ideal for millet cultivation. The region's climatic conditions are favourable for millets like sorghum and pearl millet.

Bankura: Similar to Purulia, Bankura has a mix of red and lateritic soils with a semi-arid climate, suitable for millet farming.

Birbhum: The soil here is mostly red and sandy, which is good for growing millets. The area also experiences less rainfall, making it conducive for dryland farming.

Paschim Medinipur: Certain parts of this district, particularly the western regions, have lateritic soils and less rainfall, suitable for millets like finger millet (Ragi).

Jhargram: This newly formed district, carved out of Paschim Medinipur, shares similar soil and climatic conditions and is also suitable for millet cultivation. These regions have traditionally been less reliant on irrigation and are better suited for crops that require less water, such as millets.

Howrah Suparna, an NGO working in the field of health, education, tribal studies, environment, forest, forestry, forest management, elderly people, arts and culture etc, has started engaging in millets production and its sustainability. Its secretary has been selected as the eastern regional director of Global Millets Foundation, India. In this context the organization is exploring millets cultivation and production both in the North 24 Parganas District and South 24 Parganas of West Bengal.



Frankie doesn't know what Frankie means? Yes, that's what it means! Frankie doesn't know that his name is Frankie. How is it? Who is only 8 days old, does he know his name? If Frankie doesn't know, you won't know it either. The first baby born in India in 2025 has been named Frankie! Frankie saw the light of the world at 12:00 PM on January 1 at Synod Hospital in Aizawl, the capital of Mizoram.

The year 2025 marks a generational shift: children born between January 1, 2025, and December 31, 2039, will comprise Generation Beta. Generation Beta will be the children of younger millennials and older Gen Z'ers, and is so-named because the letter Beta follows Alpha in the Greek alphabet. Demographer Mark McCrindle coined Gen Alpha. From there, the names of the next generations could follow a predictable, sequential path — Beta, Gamma, Delta, and so on.

In the world, Frankie is the second child born in Generation Beta. Remy is the first child born in Australia.

How are different generations named? Before embracing the Greek alphabet, generations were grouped in periods of 15-20 years and named after defining societal events. Baby boomers were named after the baby boom post-World War II, Generation X which succeeded them were named for their anti-establishment mindset, and millennials for those who became adults at the turn of the millennium.

Gen Beta (2025-2039) Born into a post-Covid world. They will only listen to the story of the epidemic. Moreover, this is a generation that will grow up with technology, especially artificial intelligence, from birth. Generation Beta will live in an era where AI and automation are fully embedded in everyday life-from education and workplaces to healthcare and entertainment. Generation Beta, or Gen Beta, the firm said in a research report, is represented by those

## O Frankie! Generation Beta Springs Ratul Datta

born between 2025 and 2039. Their parents will be younger millennials and older Gen Zs, and many will live to see the next millennium, the report said.

Gen Alpha (2011 – 2024) As the first generation to be born entirely in the 21st century, this is the most tech-savvy generation so far. This is a generation that has always known a world with the existence of social media and experienced the Covid pandemic in their formative years. Generation Alpha was born when social media ruled the world. Until 2025, they were the ninth generation of the world.

Gen Z (1996 – 2010) Arguably the most discussed generation today, Gen Z or the Zoomers today constitute the younger adults. This generation is the first to be truly plugged in and grow up as digital natives and grew up during the 2007 recession, a period of widespread financial instability. What distinguishes Gen Z is its political advocacy of social and environmental causes. This generation cares about their work impacting the world positively, while seeking out opportunities for personal growth.

Gen Y or the Millennials (1980 – 1995)

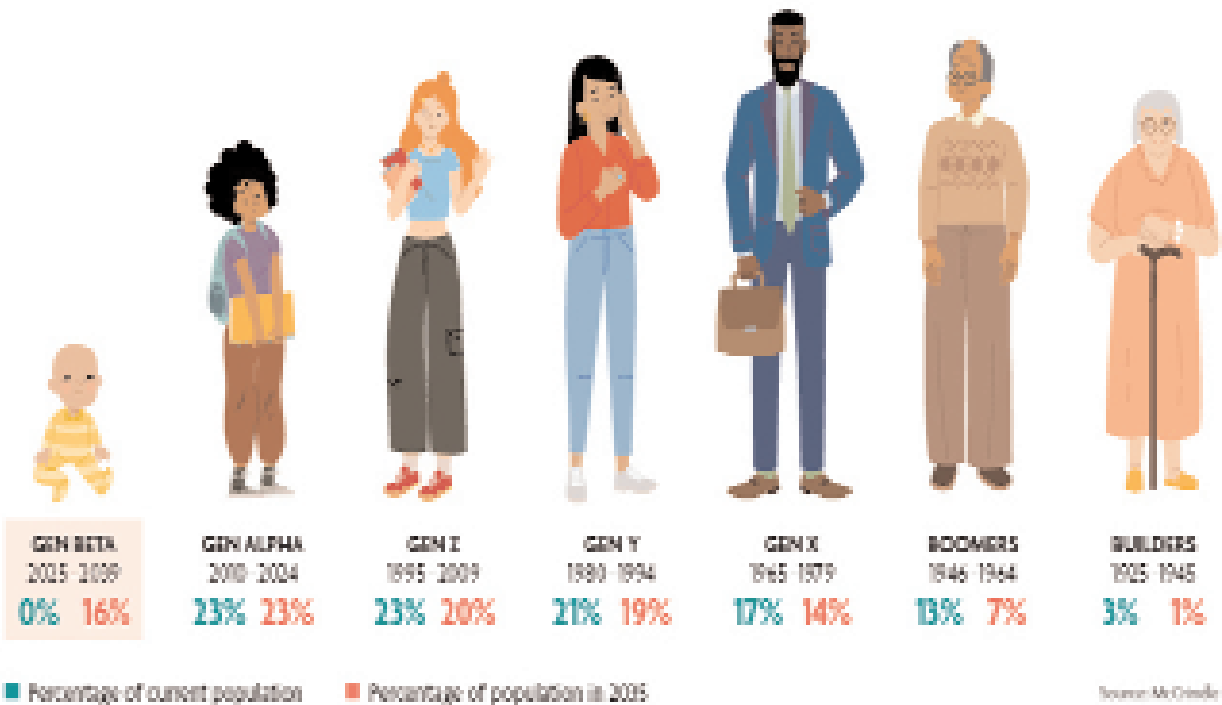
This generation is understood to have experienced similar developments globally, largely on account of the extent of their adoption of technology around the same time. This generation is tech-savvy compared to their predecessors while also being socially conscious.

Gen X (1964 – 1979) Tammy Rickson defines this generation in the US as the one that internalized the idea that many of the long-standing institutions could be challenged, with the X representing a mistrust of the establishment, be it marriage or corporate employment. X'ers in India grew up to witness the massive social and economic transformation that would come to define the country. This generation saw pop culture, this generation was also the first to talk about the LGBTQ community.

Baby Boomers (1946 – 1964) This generation was born after World War II and is named after the post-war baby boom. Considering the surge in optimism, this generation is usually associated with idealism and a mistrust of authority.

Silent Generations (1928-1945) This generation saw World War II, economic depression. This generation witnessed firsthand the recession known as the Great Depression in world history. Naturally, a large section of the population did not think of family planning at this time.

Greatest Generation (1901 - 1927) This generation saw the Great Depression, the First World War. They are the ones who popularized jazz music all over the world. A large part of this generation took part in World War II as soldiers.



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