



vigyaan tantragyaan anuvaadan

DEPARTMENT OF SCIENCE AND TECHNOLOGY

NITTE UNIVERSITY TECHNOLOGY ENABLING CENTRE



DST NU-TEC Chronicle Feb to May 2024			
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Arbotag – Naturemarks system product release

02 Feb 2024



Since the start of the industrial revolution, the concentration of CO₂ in the atmosphere has increased by over 45%, rising from pre-industrial levels of about 280 parts per million (ppm) to over 410 ppm today. This surge in CO₂ levels is leading to various consequences, including rising global temperatures, melting ice caps, and more frequent and severe weather events. To mitigate these impacts, a coordinated effort is essential. This includes reducing greenhouse gas emissions, transitioning to renewable energy sources, and adapting to the unavoidable impacts of climate change. One effective coordinated effort is afforestation, which not only helps reduce CO₂ levels in the atmosphere but also adds beauty to our surroundings. Trees, often referred to as the earth's lungs, are major natural consumers of CO₂. Corporate entities emphasize reclaiming CO2 released into the atmosphere through their activities by engaging in afforestation projects. However, it is crucial to enumerate the gross CO₂ captured by these trees to understand the full impact of these projects in bridging the gap between carbon emissions and carbon sequestration. Traditionally, this enumeration involves conducting tree surveys with large groups of volunteers who gather data on trees to assess their carbon sequestration efficiency. However, these surveys are often cumbersome, resource-intensive, and prone to errors.

In one such tree survey program, organized by Dr. Smitha Hegde, Deputy Director of NUCSER, two students realized the challenges of tree surveys. Mohd. Saif Hasmani and Shivakiran Alva, MSc. Biomedical Sciences students at NUCSER, found collecting data on trees difficult and noted the lack of a simple solution to this problem. Motivated by their experience, they decided to develop ArborTag, a device that employs machine learning models to capture crucial floral data and provide critical insights into carbon sequestration. They presented this idea at the Healthcare Innovation Hackathon, organized by Nitte DST-TEC in association with IIC and AIC-Nitte at NMAMIT, Karkala, from May 5-7, 2023. After three days of intensive brainstorming, networking, and learning, Saif and Shiv presented their idea to a panel of experts. Convincing the panel of their idea's feasibility, ArborTag was placed among the top 10 ideas at the hackathon, and the team was selected for a pre-incubation program at AIC-Nitte.

With guidance and support from Dr. Iddya Karunasagar, Advisor for Research & Patents at DST-TEC, they filed a patent application for ArborTag in May 2023. Bolstered by the confidence a patent provided, Team ArborTag attended an eight-session pre-incubation program from June to July 2023 at AIC, Nitte. In August, the team had the opportunity to present their idea to panelists from the Wadhwani Foundation, which focuses on early-stage startup incubation and training. Despite impressing the panel with the market potential of ArborTag, the absence of an incorporated entity and a functional prototype meant they were not selected for incubation at the Wadhwani Foundation.





Development of the product

Reviewing the prototype – March 2023

Undeterred, Team ArborTag, encouraged by DST-TEC, IIC, and AIC-Nitte, registered as an incorporated startup under the name NatureMark Systems. Recognized by the DPIIT, GOI as part of its Startup India initiative in August 2023, NatureMark Systems began developing ArborTag's software in September. They reapplied for the Wadhwani Foundation's Lift Off program and were inducted into its 10th Cohort for a three-month incubation in October. Subsequently, in November, NatureMark Systems was selected for a two-month Agripreneurship program at the NaaViC Agri-Business Incubation Centre, ICAR-Nivedi, Bengaluru. After months of design, development, training, and fundraising, NatureMark Systems had the first ArborTag device ready for assembly and testing in January 2024. Following successful testing, ArborTag was ready for its global debut.

On 3, February 2024, with the support of DST-TEC, IIC, and AIC-Nitte, NatureMark Systems launched ArborTag at the Avishkar Auditorium, ABSMIDS, Deralakkate, supported by NUCSER. Aiming to become a key player in providing solutions for carbon sequestration analysis and carbon credit verification, NatureMark Systems is currently in the final stages of their first seed investment round, facilitated by the Wadhwani Foundation, and is actively seeking ambitious talent for their operations.



Pitching idea to investors –EMERGE 2024



Connecting with the investor Feb 2024



"Startup and funding ecosystem in agri-food sector"

06 Feb 2024

The Nitte University DST Technology Enabling Centre, Institution Innovation Council and NUCSER jointly organized an expert lecture on "Startup and funding ecosystem in agri-food sector" on 06 February 2024 at the University Auditorium, Paneer campus. Mr Arvind Modi, Partner, Sathguru Catalysers, Hyderabad, was the resource person. He has over 12 years of experience in Venture Capital (VC) & Private Equity (PE) Investments. His area of expertise includes VC/PE investment management, capital structuring, valuations, and consulting and he has excellent business acumen with proven abilities in investment decisions. Dr Anirban Chakraborty welcomed the gathering and Dr Indrani Karunasagar introduced the resource person. The lecture was followed by active participation of the audience in the question answer session and concluded with a vote of thanks proposed by the Director of R&D, Dr Praveen Kumar Shetty.

In his expert lecture, Mr Modi detailed about grants, equity and debt and the difference between them. He also gave an insight about the Venture capitalists, their functions and consideration, market scalability and defensibility. He explained the valley of death of startups importance of angel investors. He elaborated on what startup founders need to know when preparing to pitch their business plan to the venture capitalists. He gave a glimpse of startup funding statistics along with valuation of Indian Start-up Economy. He also noted that startups may not have all expertise and they could use outsourcing to save time, cost & energy. He urged the young entrepreneurs to be conscious about cost and see that each cash burn adds to growth of the company and not to spend on corporate gifts for coworkers or clients. Until the idea is executed or the company takes off he advised the startups not to waste time and money on brand name, logo and similar issues. He shared certain tips with the startups from his experience that bigger market size does not guarantee success and can mislead everyone. He also said hiring more number of task performers (doers) than managers will help in more productivity.

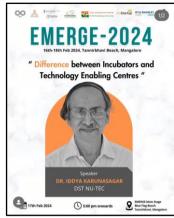


EMERGE- A Startup Conclave- 2024

16-18 Feb 2024







EMERGE 2024 was a three-day startup event hosted at Tannirbhavi beach, Mangalore, from 16-18 Feb 2024. The event attracted a diverse audience comprising of entrepreneurs, NGOs, students, investors, venture capitalists, researchers, incubators, technology enabling centers, and industry professionals across the region and all over India. DST TEC, Nitte University actively participated in this event by setting up a stall that showcased the activities of TEC, transferred technologies, available technologies and also exhibited the recently developed ArborTag device, a successful startup initiated by TEC. Prof Dr Indrani Karunsagar was a panel member in the fireside chat which involved discussion on dynamic collaboration between industry, academia and startup along with Dr Sapna Poti, Director, Strategic Alliances, Principle scientific advisers office, GoI, Industrialist Anoop Pai, founder e-Samudaay. The fireside chat explored the power of synergy in shaping the future of technology and entrepreneurship and how the three pillars - industry, academia and startup intersect, innovate and drive progress together. The session was moderated by Mr Naveen Lakkur, serial entrepreneur and innovation coach. Prof Dr Iddya Karunasagar, Advisor, TEC, gave a key note lecture on nuances between incubators and technology enabling centers. He highlighted the role of TEC and how the young entrepreneurs and investors present at the audience could join hands at propelling innovative ideas into successful global enterprises.

The sessions and discussions revolved around leveraging innovation, fostering collaboration among stakeholders, and promoting sustainable practices across different industries. The conference featured keynote speeches and panel discussions delivered by renowned speakers from diverse backgrounds. The experts shared their insights and experiences, inspiring the audience with their success stories and thought-provoking ideas. EMERGE 2024 provided a great platform to TEC to showcase the emerging technologies, technology in pipeline and also gave ample networking opportunities, for participants to connect, collaborate, and forge partnerships especially with potential investors.







A session on Key elements for the success of food industry- regulatory, technological and funding ecosystem for the food industry

28 Feb 2024





Kanara Chambers of Commerce and Industry in association with DST TEC, and Nitte DU jointly organized a session on "Key elements for the success of food industry- regulatory, technological and funding ecosystem for the food industry" on Wednesday, 28 Feb2024 at Pacific V, Ocean Pearl, Mangaluru. The gathering included members of various start-ups, entrepreneurs, students, and investors from different parts of the city. President of KCCI, CA Ananthesh V Prabhu welcomed the gathering. In his welcome address, he spoke about the importance of the food industry particularly focusing on the cashew, seafood, and spice industry in this region. Vice-President of KCCI Mr. Anand Pai introduced the speakers to the gathering.

Dr Sanu Jacob, Director of FSSAI said that the food industry has been implementing various technologies to speed up the processing of applications and approvals for the smooth business of food business operators and urged the food entrepreneurs to make good use of it. He mentioned that an online system is being used for instant change, addition, instant renewal of licenses, and for disseminating policy and regulations of the industry and this would help the food entrepreneurs to a larger extent. Due to constantly changing food processing methods, many profit seekers ignore the health of consumers, to overcome these issues various food safety regulations have come to light. Food producers, distributors, sellers, and consumers all have the responsibility to maintain food safety measures and that food remains free from external factors, internal factors, and microorganisms which is a constant challenge for food safety. Due to increased cases of food adulteration, cheating, and fraud, the Food Safety Act was implemented in 2006. In 2008 FSSAI and about 8 different acts were brought under its purview. He explained about the registration and license that food units, distributors, and those dealing with food should have, and the maximum penalty for not having a license is Rs. 5 lakhs penalty and 6 months imprisonment. If found guilty of food adulteration, the involved could be fined with Rs. 10 lakhs.

Dr K Narayanan, the Founder and director of Sthayika Seeds Pvt. Ltd, Bengaluru spoke about the rapid growth in the food sector creating ample opportunities for emerging entrepreneurs. He stated various examples that point toward saying that demand drives business. He focused that productivity increases due to improvements in technology and there is a need of mechanization in the food industry in the future to increase the output.



Mr Arvind Modi, Partner, Sathguru Catalysers, Hyderabad detailed about grants, equity and debt and the major difference between them. He also gave an insight about the Venture Capitalists, their functions and considerations, market scalability, and defensibility. He focused on what investors seek from entrepreneurs while pitching their business proposals and giving tips on what they need to focus on before seeking investments.

The session was followed by a panel discussion moderated by Prof Dr Iddya Karunasagar, Advisor (Research & Patents), Nitte University, Mangaluru. The audience actively participated in the discussion and also sought clarifications for their queries. Prof Dr Indrani Karunasagar, Director, DST TEC, Nitte University, Mangaluru delivered the vote of thanks which was then followed by High Tea.



Workshop on "Good Laboratory Practices (GLP) & Good Clinical Practices (GCP)" 26 & 27 Feb 2024

A Two-day workshop on "Good Laboratory Practices (GLP) & Good Clinical Practices (GCP)" was organized by DST Technology Enabling Centre, NGSM Institute of Pharmaceutical Sciences and K S Hegde Medical Academy on 26 & 27 Feb 2024. The two-day event was inaugurated at the university auditorium, Paneer Campus, Nitte (DU); by Prof Bikash Medhi, PGIMER, Chandigarh as the chief guest and Prof Dr Iddya Karunasagar as the presiding officer. Prof Dr Indrani Karunasagar welcomed the gathering and also gave an insight into the importance of good laboratory practices and good clinical practices. Dr C S Shastry presented the vote of thanks and the inaugural ceremony ended with the National Anthem. The inaugural ceremony was then followed by enriching sessions featuring eminent speakers like Prof. Dr. Bikash Medhi, Professor, Dr. Ajay Prakash, Associate Professor Dept. of Pharmacology, PGIMER, Chandigarh, PGIMER, Chandigarh, Dr. Shoban Babu, Associate Professor, AIIMS, Jodhpur, Dr Ektha Kapoor Head of National GLP Compliance Monitoring Authority, Dr. Rohith R Desai, Head-Oncology Medical Affairs at Dr. Reddy's Laboratories, Hyderabad, Dr. Mukul Jain, President, Zydus Life Sciences Ltd, Ahmedabad and Dr. Parasuraman Jaisankar, Chief Scientist & Head, CSIR discussed the essence of GLP and GCP.







National Technology Day 2024 11 May 2024



The National Technology Day is celebrated on May 11 every year to commemorate the successful Pokhran nuclear test conducted in 1998. The DST Technology Enabling Center, in association with Nitte University Center for Science Education and Research (NUCSER), Atal Incubation Center (AIC) Nitte, Institution Innovation Council (IIC), & the ICAR Directorate of Cashew Research (DCR), jointly organized an exposition technologies and panel discussion on 11, May 2024, in the University auditorium at Paneer Campus. Dr Dinakara Adiga, Director ICAR, DCR, was the chief guest, and Prof M S Moodithaya, the Hon'ble Vice Chancellor Nitte (DU), presided over the event. 90 participants including representatives of Farmer producing organisations, entreprenuers in agri-food sector, Mr. Giridhar Prabhu, ex-President, Kanara Chamber of Commerce and Industries, scientists from DCR, Puttur, faculty and students of NUCSER were present on the occasion.

Dr Indrani Karunasagar welcomed the gathering and Dr Iddya Karunasagar emphasized the day's significance and highlighted the importance of bringing together the stakeholders in Agri-Food technology. Dr A P Achar, CEO, AIC Nitte (DU), addressed the gathering regarding the importance and market value of cash crops in this region and stressed the need to improve market potential of locally cultivable agri-food products to contribute towards the economy. The Hon'ble VC Prof M S Moodithaya mentioned how the Nitte (DU) is developing an entrepreneurship culture with active collaboration of partner institutions to develop and promote technology.

Dr Dinakara Adiga, a visionary leader, addressed critical challenges in improving agronomic practices to tackle pest and disease management. In his talk, he detailed on the present growth in the Indian economy in various sectors. He highlighted that production and consumption of cashews has drastically increased in recent years, adding to the country's rising economy. He advised that technological advancement would be needed on product development and automatization, which can resolve the problem of labor scarcity. He also emphasised that more value-added organic products need to be produced to ensure complete utilisation of the organic agri products.



Ms Gabriella D'Cruz, a scientist and entrepreneur, The Good Ocean-seaweed-producing firm in Goa, was the invited speaker. She narrated her journey of becoming an entrepreneur and developing a seaweed processing firm. She explained the nutritional value of seaweed and how it can be used to address the deficiency of vitamins and minerals. She also discussed the challenges associated with seaweed culture and consumption, like sustainable biomass supply, consumer allergies, the requirement of cold chains for maintaining freshness and overcoming fishy smell and taste to improve product palatability.



A panel discussion session was held with the panelists that included Mr Giridhar Prabhu, CEO Achal Cashews, Ms Gabriella D'Cruz, Dr Mamatha B S, Assistant Professor, NUCSER, Dr Balasubramanian, Principal Scientist, ICAR, DCR, Mr Ravish Kumar, Entrepreneur- Sharanya Enterprises. The entire session was moderated by Dr Iddya Karunasagar. During the discussion, the panelist briefed about various agri-food products in their sector, like seaweed, cashews, ice-creams with natural flavours, and value addition to whey, a dairy waste. They also discussed on the gaps, practical problems faced by the sector and potential research areas that needs to be focused, for instance, effective extraction of pro-anthocyanin, a component of anacardic acid that has anticancer properties, development of higher-yielding varieties of cashew, etc.

The vote of thanks was proposed by Dr Anirban Chakraborty. The participants visited the technological exposition of technologies and products developed at NUCSER and at DCR Puttur and discussed the technologies with scientists.











MoU between Nitte DU and ICAR Central Institute of Brackishwater Aquaculture (CIBA)

21 May 2024





ICAR Central Institute of Brackish Water Aquaculture (CIBA) is a premier national Institute working on all aspects of brackish water aquaculture. Nitte DU and ICAR-CIBA signed a MoU on 21 May, 2024, agreeing to cooperate in skill-based training education and to bridge the gap between and basic and applied research. DST TEC enabled this collaboration, which would pave the way for the development of the scientific relationship between Nitte DU and ICAR-CIBA to foster translational research and communication for advances in multidisciplinary fields. This program would provide a conducive environment for researchers, practitioners, industrialists, aquaculturists and the seafood processing industry to collaborate and develop cost-effective solutions to the problems faced by the industry. This partnership intends to include activities like student internship, manpower training, support in developing collaborative projects for funding, conducting field validation of aquaculture technologies, hosting stakeholder meetings, expert lectures, panel discussions and sharing experience in product development.

The MoU exchange took place in the Board Room of Nitte University between the Registrar, Dr. Harsha Halahalli and Dr Kuldeep K Lal, Director ICAR-CIBA, on May 21, 2024. The Hon'ble Vice Chancellor, Dr M S Moodithaya; Dr Iddya Karunasagar, Advisor, Research and Patent; Dr Indrani Karunasagar, Director Projects and Director DST TEC; Dr Anirban Chakraborty, Director NUCSER; Mr Chethan Chakravarty, Legal Officer, Nitte and DST TEC staff were present on occasion.

Before signing the MOU, Dr Kuldeep Lal visited the DST Technology Enabling Center and Nitte University Center for Science Education and Research (NUCSER). He delivered a talk on the status of brackish water aquaculture in India.

"Bridging the know – do gap in tuberculosis care" 29 April 2024



DST TEC organized an expert talk on "Bridging the know – do gap in tuberculosis care" at Chintana hall, Justice K S Hegde Charitable Trust, Deralakatte on 29 April 2024. Prof Madhukar Pai, Inaugural chair, Dept. of Global and Public health, McGill University, Canada was the invited guest speaker. Prof Dr Indrani Karunasagar welcomed the gathering explained the mandate of TEC & its role in arranging such talks. Prof Dr Iddya Karunasagar introduced the speaker to the gathering. Around 70 participants including faculties and students from various departments and research institutes attended the talk. The talk concluded with active interaction with audience.

With a wealth of experience and expertise in the field, the speaker gave insights on one of the global health care challenges that is bridging the theory-practice gap, research- practice or knowledge-action gap in tackling tuberculosis worldwide. Dr Mackwin Kenwood D'Mello, Coordinator of Department of Public Health, KSHEMA proposed the vote of thanks.

During the talk Prof Madhukar explained the current status of TB in India and other developing countries, presented the statistics on mortality/morbidity rate, case fatality rate, & relapse rate. He presented the data from his study on understanding the difference in clinical practice through vignette and simulated patient model and discussed on how the clinicians fail to implement the standard practice of tuberculosis care. He advised that practitioners should equally focus on controlling spread of disease and treating the disease, reduce the use of empirical treatment when the patients present with classical symptoms of TB without established diagnosis. He highlighted the use of modern molecular techniques to replace conventional microscopy for rapid diagnosis and early treatment. He suggested that more research should be done to find novel specific markers or potential target candidates involved in the pathogenesis of Mycobacterium spp. that could aid in developing a vaccine. He also mentioned that understanding host susceptibility that explains the discrepancy in infection rate and exposure rate could be a potential research area.





TEC Conclave 2024

14 March 2024





DST organized a one-day TEC-Conclave at the DELNET, Jawaharlal Nehru University campus New Delhi on 14 March 2024. Coordinators from various TECs attended the meeting. Coordinators of TECs sanctioned during phase 1 and 2 made presentations on significant achievements, challenges faced during ecosystem building, suggestions/way forward for TECs etc. Dr Mamatha represented TEC, Nitte (DU) presented a consolidated report on the activities of the center (for the period 2021-24). TEC officials evaluated the activities and suggested the aspects to improve upon.

Meeting to discuss the establishment of the Center of Excellence in One Health





02 May 2024: DST TEC took the initiative to organize a meeting of faculty from medical, dental, pharmacy, nursing and biomedical faculty to develop a Center of Excellence in One Health around the FAO Reference Center on Antimicrobial Research and aquaculture biosecurity. The multidisciplinary team meeting was held on May 02, 2024 and discussed the different competencies in One Health and possibility of developing technologies that have cross disciplinary applications.





05 Feb 2024: Discussion with the startup 'GOU' on technology-related fertilizer production. Mr Arvind Modi, Angel investor advising the startup.



20 April 2024: Ms Priyalatha and Mr Aravind startup aspirants visited TEC to discuss on initiating the startup on preparation of paper from cow dung.



22 April 2024: Discussion with marine biotechnology students regarding project on zoonotic pathogens



20 April 2024: Discussion with nursing faculty from Kerala regarding copyright registration.



23 April 2024: Discussion with Mr Arjun Poonja, startup aspirant on solar powered fishcart for hygienic handling and delivery of fish



30 April 2024: Discussion with Mr VK Shrinivasa Scientific officer Karnataka Science & Technology Academy & an entrepreneur regarding technologies available in the food sector.











13-15 May 2024: Dr Iddya Karunasagar & Dr Indrani Karunasagar participated in a meeting of the global reference centre on progressive management pathway for aquaculture biosecurity –Updates and roll out monitoring at Qingdao, China jointly organized by FAO & Chinese Academy of Fisheries Sciences. The meeting was chaired by Dr JK Jena, Deputy Director General, ICAR.

16-18 May 2024: Dr Iddya Karunasagar & Dr Indrani Karunasagar presented the work on AMU/AMR surveillance and AMR related activities in FAO Reference Center on AMR and aquatic biosecurity in Nitte University at the meeting FAO reference centres at Qingdao, China.

Dr. Iddya Karunasagar was invited by the Government of the Kingdom of Saudi Arabia as Member of International Scientific Advisory Board on Food Safety Risk Assessment. Dr. Iddya Karunasagar attended the meeting of this Advisory Board on Feb 13-15 at Riyadh, Saudi Arabia and provided information related to food safety risk assessment carried out by Joint FAO/WHO bodies and the use of scientific advice by the International Standard Setting body, Codex Alimentarius Commission. Dr. Iddya Karunasagar delivered two talks on the occasion (a) Food safety considerations in aquaculture products (b) Antimicrobial resistance in aquaculture.





Serving as Session Chair and Panelist at the 13th Indian Fisheries and Aquaculture forum

23-25 Feb 2024



Dr. Iddya Karunasagar was invited by the organisers of 13th Indian Fisheries and Aquaculture Forum as Chair of Session "Frontiers in Fish Health management" and as a Panelist in the Session "13th IFAF Student interface meet". At this Forum organized by ICAR-Central Inland Fisheries Institute, Kolkata at Biswa Bangla Convention Center, Kolkatta on Feb 23-25, 2024. Dr. Iddya Karunasagar spoke about technology development and Startup in aquaculture and fisheries sector and development of skills for entrepreneurship development in Fisheries Universities

Inauguration of Student Research Club "Inventos" at Father Mueller Research Center, Mangalore

16 April 2024



Dr. Iddya Karunasagar was the Chief Guest for the inauguration of Student Research Club "Inventos" at Father Mueller Research Center on April 16, 2024. This is a multidisciplinary student club involving medical (allopathic and homeopathic), nursing, physiotherapy and allied health science students. Dr. Iddya Karunasagar emphasized the need to focus on developing a keen sense of observation, questioning current concepts and thinking and perseverance to achieve significant results in the area multidisciplinary research. Awards for best performing students were presented on the occasion.



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