

## North-East Sustainable and Inclusive Development: NESID-22

16-18 November, 2022, The Assam Kaziranga University

On 16<sup>th</sup> November, 2022, a national event on **North East Sustainable and Inclusive Development (NESID)-2022** was held at The Assam Kaziranga University. The participation of personalities like Prof. S Ayyappan, Former DG, ICAR, Prof. Mohan Kumar, Vice Chancellor Arunachal University of Studies, Dr. G N Sastry, Director, NEIST, Dr. P. K. Mishra, Vice Chancellor KU, Dr. Prashant Goswami, Chairman IFSA, brought rare depth to the NESID-22. The NESID-22 event brought together several distinguished personalities: Dr. EVSP Rao (Former Head, CSIR-CIMAP, Bangalore), Dr. Rupam Kataki (Dept. of Energy, Tezpur University), Dr Jatin Kalita (CSIR NEIST, Jorhat), Dr. Rakesh Kumar (CSIR IHBT, Palampur), Dr. Rajeshwar Shantayya Matche (CSIR-CFTRI, Mysuru), Dr. Dhurbajyoti Bhuyan (Assam Medical College, Dibrugarh), Dr. R C Borah (KU), Dr. Nabajyoti Saikia (KU), Dr. Darpa Saurav Jyethi (ISI, North-East Center, Tezpur), Prof. Shikhar Kr. Sarma (Gauhati University), Dr. V S Prakash (Former Director, KSNDMC, Bangalore), Dr. Manoj Kr. Phukan (CSIR NEIST, Jorhat), Dr. Rahul Mahanta (Cotton University), Dr. Pankaj Kalita (Department of Energy, IIT Guwahati), Dr. Swapnali Hazarika (CSIR NEIST, Jorhat), Dr. Prem Prakash Mishra (Department of Mathematics, NIT, Nagaland).

While the United Nation's 2030-agenda provides a broad framework for achieving global sustainable development, sustainable and inclusive development need to be addressed at local levels, with unique local challenges and aspirations, which is particularly true for North-East. NESID-22 is a continuation of the NESID series launched in 2017, to highlight North-East as a hotspot for the convergence of sustainable development with women empowerment and skill building, with emphasis on food, energy and inclusive health. The themes of NESID were: Sustainable Development: A Regional Perspective, S&T Inputs, Solutions and Technology Adaptation, Sustainable Development: Climate and Disaster Resilience, Policies for Inclusive Development. The key issues deliberated were followed by Plenary, Synthesis and Recommendations.

The Industry-Academic Energy Conclave: **IAEC-22**, held on 17th November 2022 during NESID-22, brought together a unique congregation of some of the industry, academic, thought leaders and stakeholders. Participation of personalities like Shri Bhaskar Jyoti Phukan, Managing Director, Numaligarh Refinery Limited, as the Chief Guest, Dr. P. K. Mishra, Vice Chancellor KU, and Dr. Prashant Goswami, Chairman IFSA, brought in rare depth of analysis to the theme of ALIST-22. The primary objective of the event was to create an implementable, technology-enabled roadmap for low-carbon, sustainable and inclusive development trajectory for North-East. The distinguished panelists were Dr. Rupam Kataki (Dept. of Energy, Tezpur University), Prof Utpal Bora (IIT Guwahati), Dr Ashutosh Namdeo (CSIR NEIST), and Dr Lakshi Saikia (CSIR NEIST).

The technical and scholarly aspects of NESID-22 were supervised by a National Organizing Committee (NOC), chaired by Dr. Prashant Goswami, Chairman, Institute of Frontier Science and Application (IFSA) and co-chaired by Dr. P. K. Mishra, Vice Chancellor, KU.

**NESID-22 also created some unique opportunities for students and faculty of Kaziranga University and other local organizations.** A large number of students and faculty participated through poster presentations and took part in question-answer sessions with the lead/keynote/invited speakers.

In the welcome address, Dr P K Mishra, Co-Chairman, National Organizing Committee and VC of Assam Kaziranga University, emphasised on the importance of education and the need to strengthen the role of the private universities in the field of education to bring sustainable and inclusive development in the north-eastern region. Dr P Goswami, Chairman, National Organizing Committee and Chairman, IFSA shared the insights on creating the roadmap for building a sustainable and inclusive north-east & how science and technology would play a key role in achieving the sustainable developmental goals. The Guest of Honour for the conference Dr G N Sastry, Director, CSIR-NEIST, highlighted the role of CSIR-NEIST in developing poultry culture, fisheries with a focus on local variety, meat Industry among many others. Prof B Mohan Kumar, Vice Chancellor Arunachal University discussed the importance of creating green reserve in bringing sustainable & inclusive development in Northeast, and emphasised the importance of education and health care facilities in Arunachal Pradesh. The Chief guest of the conference, Dr. S. Ayyappa, Former DG, ICAR, an Aquaculture scientist and Secretary to the Department of Agriculture research and education, presented that the earlier idea of entrepreneurship which consisted of land, labour and capital has now been extended to resources, infrastructure, policies, human resources and the market. Dr. S. Ayyappa highlighted the term 'agripreneur' and its scope of encouraging a sense of entrepreneurship among the youth. The way forward according to him is focusing not only on primary agriculture but also on secondary agriculture and its further diversification through dairy farming, fisheries, agro forestry, agro tourism etc.

In the lead talk on "Digital Agriculture for Sustainable and Inclusive Development in NE India", Dr. EVSP Rao, CSIR-Fourth Paradigm Institute, Bengaluru, emphasized that comprehensive and rapid technology interventions in agriculture could propel sustainable and inclusive development of the region. Smart agriculture systems using AI and ML are showing remarkable growth potential.

In the invited talk on "Waste management: Approaches and attitudes matter the most", Dr Rupam Kakati, Tezpur University, discussed key points about the global scenario of solid waste management, current practices on waste management, waste prevention or minimization, waste utilization, etc.

In the invited talk on "Edible Insects: Innovative Foods, Feeds to Therapeutics for Socio-Economic Development in North East India", Dr. Jatin Kalita, Research Planning and Business Development Division; CSIR NEIST, presented the nutritional and medicinal potential of edible insects, which are traditionally consumed as food, and use against several health ailments by the local communities of the North Eastern states of India

In the invited talk on "Food Technology - Value addition and Technology transfer in Food product in promoting technologies", Dr. Rakesh Kumar, Senior Principal Scientist & Professor, AcSIR, Agrotechnology Division, CSIR-Institute of Himalayan Bioresource Technology, discussed about efficient agrotechnological interventions for improving livelihood security and agricultural productivity in the north eastern region of India.

In the welcome address of Industry-Academic Energy Conclave: **IAEC-22**, held on 17th November 2022 during NESID-22, Dr P K Mishra, Co-Chairman, National Organizing Committee and VC of Assam Kaziranga University, introduced purpose of the conclave to all the delegates and participants. Dr P Goswami, Chairman, National Organizing Committee and Chairman, IFSA, stressed upon the

fact that renewal energy is critical to sustainable low carbon economy and activities can be incorporated through adoption of S&T. Shri Bhaskar Jyoti Phukan, Managing Director, Numaligarh Refinery Limited highlighted the alternatives that reduce the carbon footprint, such as, green hydrogen, fuel cell electric vehicles, and bamboo as raw material for production of ethanol for blending with gasoline. Shri Bhaskar Jyoti Phukan, also highlighted the use of solar panels in tea gardens replacing shade trees or in combination for green energy. Dr Ashutosh Namdeo (CSIR NEIST) reiterated that dependency on any one type of solution for our energy requirements can be detrimental and going ahead with a solar and gas based economy is sustainable. Dr Lakshi Saikia (CSIR NEIST) emphasized low-carbon footprint as the need of the hour. Prof Utpal Bora (IIT Guwahati), discussed alternatives such as bamboo and bio-charcoal.

In the lead talk on “Local Language Technology Development bridging the Digital Divide for Sustainable Development of NE India”, Prof. Shikhar Kr. Sarma Dean, Faculty of Technology, Head, Dept. of Information Technology, Director, Centre for Brahmaputra Studies, Gauhati University, discussed key points related to development of local language technology for bringing the governance, for bridging the digital divide, and for bringing the fruits of the digital revolution to the people.

In the invited talk on “Food Technology - Value addition and Technology transfer in Food product in promoting technologies”, Dr. Rajeshwar Shantayya Matche, CSIR-CFTRI, Mysuru, highlighted the potential of food processing and other agri-businesses as India's north-eastern region (NER) is endowed with various sorts of fruits, vegetables, and other agro-products.

In the invited talk on “SDG and Inclusive Health” Dr. Dhurbajyoti Bhuyan, Assam Medical College, Dibrugarh, emphasized universal health coverage (UHC) and access to quality health care

In the invited talk on “Sustainability in Construction Industry through Innovative Approaches in Cement and Concrete Productions”, Dr. Nabajyoti Saikia, The Assam Kaziranga University, Jorhat, presented that the sustainable way of concrete productions is the only choice for balanced growth of concrete industry.

In the invited talk on “Sustainable Clean Coal Technology for Methanol Production”, Dr. Ramesh Chandra Borah, The Assam Kaziranga University Jorhat, highlighted that biomass is one of the important renewable energy sources, which has the ability to reduce the greenhouse gases emissions due to its carbon neutral nature.

In the invited talk on “Source apportionment and risk assessment of elemental load in rural household dust in Brahmaputra fluvial plain”, Dr Darpa Saurav Jyethi, Indian Statistical Institute, North East Centre, Tezpur, highlighted that exposure to dust in poorly ventilated households using predominantly solid fuels contributes to health risks.

In the lead talk on “Sustainable Development in NER: Data, Data Analytics and new learning”, Dr. V S Prakash, Former Director, KSNDMC, Bangalore, highlighted the need to address changing land use pattern & climate change eventualities by macro, meso and micro scale monitoring programs to achieve sustainable development in the NER.

In the invited talk on “Quest for Earthquake Disaster Resilience in the Northeast India”, Dr. Manoj Kr. Phukan, Geoscience & Technology Division, CSIR-NEIST, presented scientific interventions to reduce seismic risks and highlighted the measures towards achieving seismic disaster resilience in North-east.

In the invited talk on “Hydro-meteorological Disasters Climate Change and extreme weather events”, Dr. Rahul Mahanta, Cotton University, discussed the effects of global warming effects on variations in precipitation and heavy rains in addition to higher temperatures and heat waves.

In the invited talk on “Waste material based super hydrophilic membrane for oil-water separation”, Dr. Swapnali Hazarika, CSIR NEIST, Jorhat, presented beneficial effects of separation of oily organic contaminants in wastewater in terms of separation efficiency, separation time, durability of the membrane and energy.

In the invited talk on “Optimization of QL Index to achieve SDG under Statistically Significant Linear Constraints in Nagaland”, Dr. Prem Prakash Mishra, Department of Mathematics, NIT, Nagaland, presented statistical quantification approach to optimize the quality-of-life index (QL Index) to achieve the sustainable development goals.

In Plenary, Synthesis and Recommendations, Dr. S. Ayyappan, Former DG, ICAR, an Aquaculture scientist and Secretary to the Department of Agriculture research and education, stressed on the identification of key areas for a focussed approach on the development of the North-East states.

**NESID-22 is jointly organized by The Assam Kaziranga University and The Institute of Frontier Science and Application (IFSA)**, an organization under Science for Inclusive Development Trust (SIID).

The poster prizes are awarded to the following participants:

**Poster 1<sup>st</sup> Prize:**

SARS-CoV-2: Wastewater based epidemiology (Spatiotemporal) as an early warning detection system

Gayatri Gogoi<sup>a,b</sup>, Rashmi Rani Boro<sup>a,b</sup>, Subhahsree Lahon<sup>a,b</sup>, Emon Kalyan<sup>a,b</sup>, Pankaj Bharali<sup>a,b</sup>

<sup>a</sup>Academy of Scientific and Innovative Research (AcSIR), Ghaziabad-201002, India

<sup>b</sup>Center for Infectious Diseases, Biological Sciences and Technology Division, CSIR-North East Institute of Science and Technology, Jorhat, Assam, India

**Poster 2<sup>nd</sup> Prize:**

GNSS permanent stations for hydrological applications

Jagat Dwipendra Ray

Department of Physics, The Assam Kaziranga University, Jorhat 785006, Assam, India

**Poster 3<sup>rd</sup> Prize:**

Cellulose nanocrystal based mixed matrix membrane for separation of CO<sub>2</sub>/N<sub>2</sub>

Prathana Bora<sup>1,2</sup>, Swapnali Hazarika<sup>1,2</sup>

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