CSIR in Media

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News Bulletin

1st to 10th September 2018

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Students of Atomic Energy Central School visit NML

CSIR-NML

10th September, 2018

Jamshedpur : A group of 32 students from Atomic Energy Central School, Narwapahar accompanied by two teachers Raghunath Kisku and Renuka Bala Bhakat visited at CSIR-National Metallurgical Laboratory, Jamshedpur and interacted with scientists and research scholars this morning under the aegis of "JIGYASA Programme". The objective of the programme is to provide exposures of research environment and simultaneously motivate towards science among school students and further pursue career in the science stream. The students were thrilled to visit the laboratory and interact with the working group.

The programme was scheduled for a duration of five hours, which includes Brief up about CSIR and NML, documentary film show and laboratory visits. Dr. P.N. Mishra, Principal Scientist delivered welcome address and brief up about the programme, introduced team members of Jigyasa programme to students and accompanying faculties. Dr. S.K. Mandal, Chief Scientist and coordinator of the programme discussed about CSIR-NML and function of various R&D division and how, NML pursuing research for the benefit of industries in particular and common-man in general. The students expressed their feelings, asked numbers of questions and clarify their doubt with scientists. Dr. A.K. Sahu, Sr. Technical Officer briefed the students about the importance of programme and their visits to NML. He proposed the vote of thanks. Further, a laboratory visit programme was arranged by Dr.P.N. Mishra & Shri S.N. Hembram and visited at Analytical Chemistry Centre, Materials testing and evaluation division and Electronic Waste Units and Museums.

Students were impressed to observed equipment and facilities available at the Analytical Chemistry Centre. Mrs. Savita Soni, explained abut role of chemical analysis unit and how performing analysis of minerals, ores, water. Students further visited at creep testing units of MTE Division, Mr. Prabir Kumar Roy, explained about the fatigue, creep, fractures prevailing in different types of industrial components like boiler, reformer tubes, pressure vessel etc. Students get exposure of different machine like Servo Hydro Testing Machine, Servo Electrical Machine and furnace.

The laboratory setup of Electronic Waste Unit was also attracted students and teachers, Ms. Rekha Panda, beautifully explained the methodology and the steps involved in recycling of various electronic appliance for recovery of valuable metals like gold, copper, lithium, cobalt, nickel etc.

The NML museum was the attraction among the students & appraised the well decorated museum with plenty of samples and wall mounted posters that highlight the latest and old technologies and products developed by the NML.

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Avenue Mail

Technology to convert waste plastic into fuel

CSIR-IIP

9th September, 2018

NIT-C partners with FACT for the pilot plant

How often have you given a thought to recycling of plastic waste into fuel? Well, a technology developed by the National Institute of Technology, Calicut, (NIT-C), to convert assorted plastics to useful petroleum products is bringing the idea to fruition. The NIT-C and the FACT Engineering Design and Organisation (FEDO), the consultancy division of Kochi-based FACT Ltd, have inked a memorandum of understanding (MoU) for the design and implementation of a pilot plant for converting waste plastic into energy.

"We have already made a prototype. Nearly 89% of conversion is possible with this technology and the residue is equivalent to ash. Petrol is extracted from the plastic oil," Lisa Sreejith, professor of chemistry, NIT-C, told *The Hindu* on Saturday. She said the FEDO would execute the project on the NIT-C campus within a year. Prof. Lisa, who has developed a technology for converting plastics into energy, said the project would be implemented under the Swachhata Action of the Ministry of Human Resource Development.

She said normally seven types of plastics with numbers ranging from group 1 to group 7 are found in the market. Group number one is Polyethylene Terephthalate (PET) used for making bottles for soft drinks and containers for jams while group 2 is High Density Polyethylene (HDPE) and group 3 is Polyvinyl Chloride (PVC). "The technology developed at the NIT-C is for all types of plastics. Besides, it is cost-effective without the generation of any type of pollutants," said Prof. Lisa, who had earlier carried out research on converting plastics to cooking gas. The MoU was signed by Sivaji Chakravorti, Director, NIT-C, and B.K. Geetha, general manager, FEDO, on Friday. Already Prof. Lisa has filed a patent for getting an exclusive right for the technology developed by her.

Previously, the Hyderabad-based CSIR-Indian Institute of Chemical Technology, under the Ministry of Science and Technology, had developed a catalyst that could be used for conversion of waste plastics to fuel oils. Likewise, the Dehradun-based CSIR-Indian Institute of Petroleum in collaboration with GAIL (India) Limited had developed a process by which waste polyethylene and polypropylene type plastics can be converted into petrol and diesel.

Published in:
The Hindu

CSIR-IICT

8th September, 2018

IICT ultra-filtration systems installed in Kerala districts

- To provide purified drinking water for the locals
- More water purification systems to installed in other districts
- Staff contribute Rs. 14,65,027 to the Chief Ministers' Distress Relief Fund

The hand- pump operated ultra-filtration system at flood-affected Panamaram village, Wayanad district, Kerala

Blow-up of the hollow fiber membrane module

OUR BUREAU

Tarnaka: At the behest of Dr. S Chandrasekhar, director, Indian Institute of Chemical Technology (IICT), the membrane group led by Dr S Sridhar, senior principal scientist, installed ultra-filtration systems of 700 lit/hr capacity each in Wayanad district as well as the badly-affected Kuttanad district of flood ravaged Kerala.

Some of the affected villages covered include Panamaram and Thakazhi with around 500 families benefiting from IICT's efforts. Dr. Sridhar also indicated that more such installations would be completed in Kuttanad, Trivandrum and Kottayam districts during the next one week to lend further helping hand to locals.

The technology involves the application of hollow fiber membranes that remove turbidity and pathogens from flood water. A hand pump is used to create the pressure difference across the membrane for purifying the water, as electricity is not available in remote areas during floods. A smart chlorine cartridge is provided to eliminate any secondary contamination by harmful disease-causing microbes.

The IICT director also arranged to send a cheque to Chief Minister of Kerala for an amount of Rs. 14,65,027 contributed towards the "Chief Ministers' Distress Relief Fund" by the staff members and students of the institute.

THE HANS INDIA Sat, 08 September 2018
epaper.thehansindia.com/c/32053013

Published in:
The Hans India

CSIR-IICT

8th September, 2018

IICT scientist Dr Chandrasekharam honoured by CRSI with Bronze medal

OUR BUREAU

Tarnaka: Dr Chandrasekharam, senior principal scientist, Indian Institute of Chemical Technology (IICT), and a professor in the Academy of Scientific and Innovative Research, Hyderabad, has been honored with the prestigious bronze medal by the Chemical Research Society of India. The medal and a certificate were awarded by president of CRSI on July 14 at the Indian Institute of Science Education and Research, Bhopal (IISERB). He earned the honor for significant contributions in research in chemistry.

Dr. Chandrasekharam was trained in organic chemistry and gained wide experience in the areas of green technologies, organo-metalics, total synthesis, pharmacologically important molecules and materials for energy applications.

He reported some reactions in the universal and green solvent, water. His research group immensely contributed to the synthesis and photovoltaic properties of several ruthenium and metal-free organic sensitisers for applications in the solar energy conversion. He made significant research contributions in this area and achieved certified world record efficiency of 11.4 per cent in DSSCs in 2012, employing the co adsorbent designed and developed at IICT.

THE HANS INDIA Sat, 08 September 2018
epaper.thehansindia.com/c/32053054

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CSIR-NAL

8th September, 2018

Kannur International Airport one step closer to begin operations

TNN | Sep 8, 2018, 09:41 IST

Kial authorities are planning to launch commercial operations by October-end.

KANNUR: With the setting up of a weather equipment and an Instrument Landing System (ILS), the Kannur International Airport (Kial) is now one step closer to commercial operations and a trial landing using a bigger aircraft is likely to be held in the coming days.

"We are ready for operations. We are considering a trial landing using a bigger commercial aircraft," said a senior official with the Kial. The date would be finalized in consultation with regulatory authorities, he said.

Since Kial is a greenfield airport, a passenger aircraft has to land here to ensure that it is ready for commercial operations so that it receives a final licence.

The equipment for the weather station was installed by the officials from the India Meteorological Department, Pune and the National Aerospace Laboratories, Bengaluru.

It consists of a runway visual range (RVR) system and an aviation weather monitoring system (AWMS). These devices collect real-time data on visibility, temperature, pressure, wind and relative humidity.

The RVR system, known as Drishti, developed by the Council of Scientific and Industrial Research -National Aerospace Laboratories (CSIR-NAL) is a first- of-its-kind visibility measuring system. The AWMS was developed jointly by CSIR-NAL and the IMD, the official said.

It measures wind speed, wind direction, pressure, temperature, dew point and relative humidity. Since both these systems were indigenously developed, they were cheaper compared to imported systems, he added.

As of now, the plan is to make the airport commercially operational by October-end, said Kial authorities.

Published in:
The Times of India

India To Make Two-Seater Passenger Aircraft By 2019

CSIR-NAL 7th September, 2018

BENGALURU: State-run National Aerospace Laboratories (NAL) of the Council of Scientific and Industrial Research (CSIR) has tied up with Delhi-based Mesco Aerospace to develop two-seater Hansa-NG aircraft, the company said today.

"The agreement between the companies to design, develop, produce and market the Hansa-Next Generation (NG) aircraft will ease the availability of indigenous aircraft for pilot training," city-based NAL director Jitendra J. Jadhav said in a statement.

The aircraft is expected to be ready by 2019 for its first flight and will be certified by the regulatory authority Directorate General of Civil Aviation (DGCA) by March 2020. Once certified, Delhi-based Mesco will undertake production of Hansa, the Indian name of the bird swan, Mr Jadhav said. "Mesco will set up a service centre for the aircraft and market it in India and abroad," the statement added.

The Hansa-NG can also be used for bird reconnaissance at airfields, cadet training, coastal surveillance and hobby flying. NAL targets to sell the aircraft at a cost of Rs. 80 lakh for the basic version and Rs. 100 lakh for a fully loaded version.

According to market reports, NAL estimates the country's current need at 70-80 two-seater aircraft.

Published in:
NDTV

अध्ययन

जलवायु परिवर्तन निगरानी में मदद कर सकते हैं शैवाल

भारतीय वैज्ञानिकों ने अरुणाचल प्रदेश के तवांग जिले में पाई जाने वाली 122 शैवाल प्रजातियों को किया सूचीबद्ध, इनमें से 16 का जैव-संकेतक के रूप में किया जा सकता है प्रयोग

नई दिल्ली, आइएसडब्ल्यू : भारतीय वैज्ञानिकों के एक ताजा अध्ययन में अरुणाचल प्रदेश के तवांग जिले में पाई जाने वाली 122 शैवाल प्रजातियों को सूचीबद्ध किया गया है। इनमें से 16 शैवाल प्रजातियों का उपयोग जलवायु परिवर्तन की निगरानी के लिए जैव-संकेतक के रूप में किया जा सकता है।

तवांग की नागुला झील, पीटीएसओ झील और मंगलम गोम्पा के सर्वोच्च शिखर बिंदुओं पर विस्तृत सर्वेक्षण के बाद वैज्ञानिकों ने शैवाल के 250 से अधिक नमूने एकत्रित किए हैं। इन निगरानी क्षेत्रों को शैवालों के वितरण और जैव विविधता के दीर्घकालिक अध्ययन के लिए क्रमशः 3000, 3500 और 4000 मीटर की ऊंचाई पर स्थायी स्थलों के रूप में विकसित किया गया है। इन क्षेत्रों के अलावा तवांग मॉनेस्ट्री और सेला दर्रे के आसपास के इलाकों से भी नमूने इकट्ठे किए गए हैं।

विभिन्न वैज्ञानिक विधियों के उपयोग से शोधकर्ताओं ने पाया कि एकत्रित किए गए नमूनों में 122 शैवाल प्रजातियां शामिल हैं। ये प्रजातियां 47 शैवाल श्रेणियों और 24 शैवाल वर्गों से संबंधित हैं। इन प्रजातियों में परमेलिआचिये कुल की सर्वाधिक 51, क्लैडोनिआचिये कुल की 16, लेकैनोरैचिये कुल की सात, साइकिआचिये कुल की छह और रैमेलिनाचिये कुल की पांच शैवाल प्रजातियां शामिल हैं। वैज्ञानिकों के मुताबिक, जलवायु और पर्यावरण में होने वाले बदलावों के प्रति संवेदनशील होने के कारण विभिन्न शैवाल प्रजातियों को पारिस्थितिक तंत्र के प्रभावी जैव-संकेतक के रूप में जाना जाता है। शैवालों की निगरानी से पर्वतीय क्षेत्रों में हो रहे पर्यावरणीय बदलावों से संबंधित जानकारियां जुटाई जा सकती हैं और इससे संबंधित आंकड़ों का भविष्य के निगरानी कार्यक्रमों में भी उपयोग किया जा सकता है। इस अध्ययन से जुड़े शोधकर्ता, एनबीआरआई के पूर्व उप-निदेशक डॉ. डीके उप्रेती ने बताया कि किसी क्षेत्र विशेष में जीवित शैवाल समुदाय संरचना से उस क्षेत्र की जलवायु स्थितियों के बारे में पता चल सकता है। शैवाल संरचना में बदलाव से वायु गुणवत्ता, जलवायु और जैविक प्रक्रियाओं में परिवर्तन के बारे में पता लगाया जा सकता है।

इन्होंने किया अध्ययन

लखनऊ स्थित राष्ट्रीय वनस्पति अनुसंधान संस्थान (एनबीआरआइ), अहमदाबाद स्थित इसरो के अंतरिक्ष उपयोग केंद्र और ईटानगर स्थित नॉर्थ ईस्टर्न रीजनल इंस्टीट्यूट ऑफ साइंस ऐंड टेक्नोलॉजी के वैज्ञानिकों द्वारा किया गया यह अध्ययन शोध पत्रिका प्रोसीडिंग्स ऑफ द नेशनल एकेडेमी ऑफ साइंसेज में प्रकाशित किया गया है।

यह मिलेगी मदद : इस अध्ययन से जुड़े एक अन्य शोधकर्ता डॉ. राजेश बाजपेयी ने बताया कि, जैव-संकेतक शैवाल उथल-पुथल रहित वनों, हवा की गुणवत्ता, वनों की उम्र एवं उनकी निरंतरता, त्वरित अपरदन रहित उपजाऊ भूमि, पुराने वृक्षों वाले वनों, नम एवं शुष्क क्षेत्रों, प्रदूषण सहन करने की क्षमता और मिट्टी के पारिस्थितिक तंत्र के बारे में जानकारी उपलब्ध कराने का जरिया बन सकते हैं।

Published in:

Dainik Jagran, Page no. 14

CSIR-CECRI

5th September, 2018

CECRI's research draws Boeing, global players

M RAMESH

Chennai, September 4

The Central Electro-Chemical Research Institute (CECRI) at Karaikudi, Tamil Nadu, one of the 38 Government-owned research laboratories under the Council for Scientific and Industrial Research (CSIR), is getting assignments from a marquee customer — Boeing.

Boeing approached CECRI four years ago after seeing a research paper by S Mohan, chief scientist. The aircraft manufacturer asked CECRI to develop an electrolyte for chrome-plating to replace the toxic electrolyte it was using.

"It took us three years to develop it," said Mohan, who developed for Boeing a 'trivalent electrolyte' which is more benign than the toxic 'hexavalent' form. The project was completed recently. CECRI and Boeing jointly own the patents.

Four other assignments

Since then, Boeing has given four such assignments to the institute. "Right now, four such jobs are underway," Mohan told *BusinessLine*.

One is for developing a 'smart paint' with self-healing properties. "If a scratch occurs, the first instance of corrosion triggers an 'inhibitor' in the paint which spreads itself and repairs the scratch, said S Sathiyanarayanan, senior principal scientist, at Karaikudi.

Another one is a corrosion data-base for various alloys used in aerospace. Boeing will give the alloys, and CECRI will test it for various corrosion parameters. It will then hand over the data to the aircraft major. The job which began in 2015 is in its third phase. "Every year, they give us about 20 samples," Sathiyanarayanan said.

The other assignments are for fabricating special alloys using 3D printing technology and testing them for corrosion properties; and developing a a 'wash primer', a thin coat for steel surfaces.

All these assignments might earn CECRI about ₹2-3 crore, but the institute is happy to have a high-profile company among its customers.

Others follow

Two other global biggies have followed Boeing in giving assignments to CECRI — Airbus and Applied Materials. CECRI refused to comment because of non-disclosure agreements. But it is learnt that these projects have just been received.

CECRI has also developed a process for Tata Steel to recover tin from slag from its steel plants. Principle John Berchmans who handled the project said that while a kg of tin costs ₹1,400, recovering the metal with CECRI's process costs ₹300 a kg. It is learnt that Tata Steel is now considering putting up a pilot project for this purpose.

Published in:

Business Line, Page no. 10

Currency notes spread dysentery, TB, ulcer? Traders body asks FM Arun Jaitley to find out

CSIR-IGIB

4th September, 2018

Referring to numerous scientific reports that indicate currency notes are major carriers of contaminated diseases, traders body Confederation of All India Traders (CAIT) has asked Finance Minister Arun Jaitley to assess the possibilities of diseases getting spread this way and take preventive steps. Referring to numerous scientific reports that indicate currency notes are major carriers of contaminated diseases, traders body Confederation of All India Traders (CAIT) has asked Finance Minister Arun Jaitley to assess the possibilities of diseases getting spread this way and take preventive steps. "It is regretted to note that the scientific journals have been publishing these alarming facts almost every year, but sadly no cognizance has been taken of this serious public health issue," CAIT claimed. The traders body has referred to the scientific reports that have suggested contagious diseases such as dysentery, TB, ulcer, urinary and respiratory tract infections, skin infections and recurrent meningitis, are being transmitted through currency notes. The CAIT has sent copy of the communication to Union Health Minister JP Nadda and Union Minister for Science & Technology Harshvardhan for taking immediate cognisance of the gravity of the issue. CAIT's communication to finance minister referred various studies including one conducted by Institute of Genomics and Integrative Biology (IGIB), one of the top ranking institutes under Council of Scientific and Industrial Research (CSIR), which found traces of DNA footprints of at least 78 disease-causing micro-organisms on these notes, though not all of them on a single one. Similarly, referring to a report published in the Journal of Current Microbiology and

Applied Sciences in 2016, the traders' body said that 86.4 percent of the 120 currency notes tested at the department of microbiology, Tirunelveli Medical College, Tamil Nadu, were contaminated with disease causing pathogens such as Klebsiella Pneumoniae, E.Coli , Staphylococcus aureus. A majority of them were fungi, but there were also bacteria that can cause dysentery, tuberculosis and ulcers, it added.

Published in:
The Financial Express

They Flew jets on seed oil. Next stop is the kitchen.

CSIR-IIP

3rd September, 2018

For eight years, a team of 20 scientists worked to convert the small black seeds of the jatropha plant into fuel to fire the engines of a jet plane. On August 27, their work at the verdant campus of Indian Institute of Petroleum (IIP) in Dehradun paid off. Three hundred and thirty kilos of bio-jet fuel developed from jatropha — a hardy plant with nearly 40% oil content — was partially used to propel a 45-minute SpiceJet flight from Dehradun to Delhi. The IIP team took four days to extract this quantity of oil, which was used in the right engine of the plane. "Since this was a test flight, only 25% of bio-jet fuel was used and the rest was conventional aviation turbine fuel (ATF). International standards cap the use of bio-jet fuel at 50% in each engine," says Dr Anjan Ray, director, CSIR-IIP. Feedstock for bio-jet fuel can be obtained from 400 types of plant seeds. This initiative relied on jatropha as it was readily available from the Chhattisgarh Biofuel Development Authority. "Around 500 farmers from Maoist-hit villages grow this crop. It's transforming their lives," says Ray.

Planes use kerosene-based fuels, which are polluting. According to the Intergovernmental Panel on Climate Change (IPCC) and World Meteorological Organisation (WMO), air transport contributes to 4.9% of climate change. Burning biofuel also leads to emissions but they're less toxic. "Any hydrocarbon fuel will generate about 3.15 tons of CO_2 per ton of fuel combusted. But when we burn fuel that's been obtained from a plant, its carbon emission is balanced by the carbon the plant absorbs from the atmosphere. Using 100% bio-jet fuel on a flight can bring down its carbon footprint by 50-80% depending on

feed stock, supply chain and process of production," explains Ray. Another benefit is reduced air pollution. "Conventional aviation fuel contains 3,000 parts per million of sulphur that leads to emission of sulphur dioxide. Biojet fuel contains less than 10 parts per million sulphur."

The IIP is also working on ways to turn used cooking oil into biofuel for both jets and automobiles. A litre of used cooking oil can yield 850-950ml of biodiesel. India's Food Safety and Standards Authority (FSSAI) has introduced regulations from July 1 that bar eateries from reusing cooking oil, and instead encourages them to pass it on to biofuel developers. "Annually, about 23 million tonnes of cooking oil is consumed in India," says an FSSAI communication. "The conventional jet fuel demand in India is 6-7 million tonnes, up to half of that can be technical substituted by bio-jet fuel, and about a third of this half can be obtained from used cooking oil," says Ray.

If biofuels have benefits, why are cars and planes still powered by petrol and kerosene? It's the cost and the difficulty of manufacturing it on an industrial scale. Globally, bio-jet fuel is 60-70% more expensive than conventional fuel.

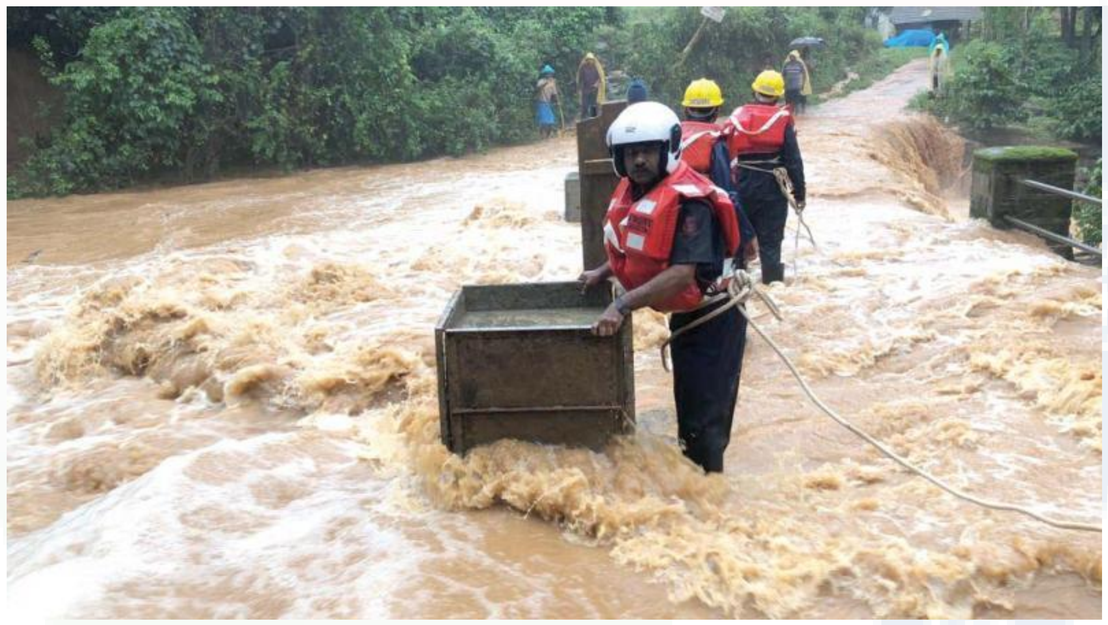
Sceptics say developing biofuels is not a sustainable and long-term solution to climate change. But Dr Ray says that the low cost of feedstock and used cooking oil in India could make bio-jet fuel quite competitive with ATF. Another argument levelled against biojet fuel is that growing feedstock for it could compromise food production. "Fuel crops should never replace food crops, but be planted in a planned manner on non-competing land to supplement farmer income," says Ray in defence of greener fuel. Despite the criticism, the team at IIP has moved ahead. They are shopping for a suitable commercial partner to scale up production of biofuel.

Published in:
The Economics Times

Ten minor tremors rock Kodagu every day

CSIR-NGRI

2nd September, 2018



Scientist Vijaya Raghavan said the seismograph was installed after a team from the institute visited Kodagu to conduct a geotechnical study.

Over 10 minor tremors of less than one magnitude on the seismograph are being recorded almost every day in Kodagu by the temporary Seismic Monitoring Observatory that was installed on August 23 by the National Geographical Research Institute, Hyderabad (CSIR-NGRI) at Navodaya Vidyalaya, 8 km from Madikeri.

Scientist Vijaya Raghavan of NGRI, Hyderabad, said the seismograph was installed after a team from the institute visited Kodagu to conduct a geotechnical study. "Going by the seismographic reports that we have received since then, over 10 minor tremors of less than one magnitude are being reported almost every day both west and south west of Navodaya Vidyalaya. We believe the tremors are landslide induced. They are too minor to make any impact, but they have been reported to the district administration," Mr Raghavan told Deccan Chronicle. According to Isaac P.M., principal of Navodaya Vidyalaya, the tremors are reported around Madikeri, Gaalibeedu, Kaaluru, Hebbatgere, and Mannangeri in Kodagu. Gangaram Baderia, principal secretary and Relief Commissioner, revenue department (disaster management), said that the tremors were highly localised and shallow. "Such tremors lose their energy locally and generally do not travel over large distances, often being limited to just 10 to 15 km or a maximum of 20 km," he said, when contacted.

Published in:

Deccan Chronicle

CSIR-NEERI holds meet to strengthen slaughterhouse-dairy partnership

CSIR-NEERI 1st September, 2018

CSIR-National Environmental Engineering Research Institute (CSIR-NEERI) organised a business meet in the NEERI Auditorium recently to strengthen the partnership with slaughterhouses and dairy industries for environmental protection. While Ashish M Paturkar, vice-chancellor, Maharashtra Animal and Fishery Sciences University (MAFSU), Nagpur, was the chief guest, R K Rathod, senior manager, Mother Dairy, Nagpur, and Rakesh Kumar, director, CSIR-NEERI, were the guests of honour. Paturkar inaugurated the meet, at which N N Rao, chief scientist, CSIR-NEERI, and Girish Pophali, the institute's principal scientist, were also present. While addressing the participants, Paturkar said that there was a need to assess the status of the country in terms of water consumption and waste management at slaughterhouses and dairy industries. "These industries should treat the wastewater before discharging into the environment," he added, stating that though the environmental norms were enough, the change in mindset is essential to protect the environment from these industries. Paturkar urged the scientists to work on reduction of water consumption and effective treatment processes in slaughterhouses and dairy industries. He pointed out that there was a discrepancy in capacity of slaughterhouses and waste treatment systems, and advised the scientists and industries to design the compact effluent treatment plants (ETPs) to get maximum treatment with minimum cost. "The industries should also make profit through recycling of the waste from slaughterhouses and dairy industries," Paturkar suggested. Rathod said that the dairy industry consumed a lot of water. "Therefore, efficient water use and effluent management by the dairy processing industry are very much needed," he added. "A proper ratio of milk and water should be maintained by the industry, as the milk already contains 80 per cent water," Rathod stated. He stressed on the need to use more anaerobic treatment systems for methane production from dairy wastewater which can be used as a biofuel.

Rathod urged the scientists to explore more environment-friendly processes for the treatment of dairy wastewater. In his welcome address, Rakesh Kumar, director, said, "CSIR-NEERI has provided the solutions to various industries for waste water treatment and management." He informed that the institute played a vital role to set up common effluent treatment plants (CETPs) in Rajasthan, Delhi and Punjab. Kumar advised the participants to understand the processes and customise at the industry and spread the outcome of this business meet to consultants and practitioners. This business meet illuminated the issues like segregation, processing, recovery of value-added products from the waste along with the implementation of policies. Girish Pophali, principal scientist, gave an overview of this business meet. A K Bansiwal, head, Business Development Group, briefed about the significant achievements of CSIR-NEERI and explored business opportunities. The representatives of the State Pollution Control Boards (SPCBs), the Central Pollution Control Board (CPCB), urban local bodies (ULBs), industries and research institutions participated in this event.

Scientists Pravin Manekar and Sukdeb Pal were also involved in organising this event, while scientist Rima Biswas Mondal conducted the proceedings.

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