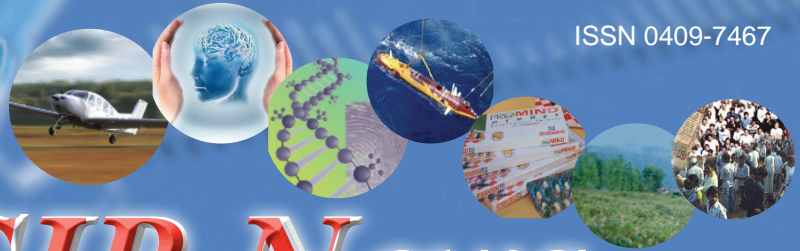




ISSN 0409-7467



CSIR News

NEWSLETTER OF THE COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

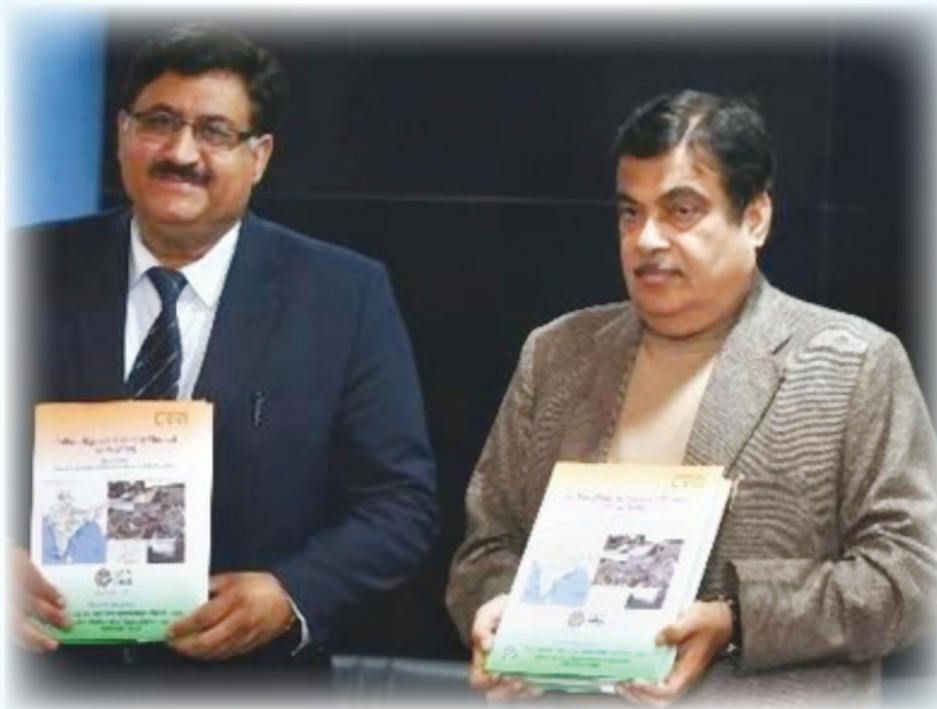
Volume 68 No. 05 & 06

website: <http://www.csir.res.in>

March 2018

In The News

Union Transport Minister Releases India's First "Highway Capacity Manual" Developed by CSIR-CRRI



Union Minister for Road, Transport & Highways, Shri Nitin Gadkari releases the Indian "Highway Capacity Manual"

THE country's first ever "Highway Capacity Manual" (HCM) was recently released by Union Road Transport & Highways, Minister Shri Nitin Gadkari. The manual will guide road engineers and policy makers about road expansion.

The manual has been developed by the CSIR-Central Road Research Institute (CSIR-CRRI), Delhi on the basis of an extensive, country-wide study of the traffic characteristics on different categories of roads like single lane, two-lane, multi-

Countries like the US, China, Malaysia, Indonesia, Taiwan have had their own Highway Capacity Manuals for quite some time. This is the first time that the manual has been developed in India.

lane urban roads, inter-urban highways and expressways and the associated intersections on these roads.

The study was conducted in collaboration with seven academic institutions including IIT-Roorkee, Mumbai and Guwahati; School of Planning and Architecture, New Delhi; Indian Institute of Engineering and Science and Technology, Shibpur; Sardar Vallabhai Patel National Institute of Technology, Surat and Anna University, Chennai.

Countries like the US, China, Malaysia, Indonesia, Taiwan have had their own Highway Capacity Manuals for quite some time. This is the first time that the manual has been developed in India. The manual lays down guidelines

for when and how to expand or manage different types of roads and their intersections and the level of services to be put in place. It has been developed based on the unique nature and diversity of traffic on Indian roads.

Shri Nitin Gadkari expressed the hope that the long awaited manual would help in the scientific planning and expansion of road infrastructure in the country. He also said that there was a need to popularise the use of new materials like fly-ash, plastic, oil slag and municipal waste in road construction. He also called upon researchers and engineers to expedite formulation of a good design for safe and effective speed breakers for Indian roads.

Indigenous Anti-Counterfeit Ink

The CSIR-National Physical Laboratory (CSIR-NPL), New Delhi, is at it again. The laboratory that gave us the indelible ink is all set to launch a high security ink that makes counterfeiting difficult.

Dr. Bipin Gupta and his team have described a novel process of manufacturing that makes an all-purpose security ink a reality. The process is reported in *Chemistry: A European Journal* (DOI: 10.1002/chem.201704076). The new ink has been developed in response to the “Make in India” call by the Honourable Prime Minister, says Dr. Bipin Gupta.

Security inks are essential and crucial for printing of currency. They help prevent any counterfeits, and in such an event make their detection easy. The first step that we all follow in detection of a counterfeit is to scan it under UV light. One could then clearly see features

that are normally not visible, since those features are printed with a special ink that glows – or fluoresces – only when exposed to ultraviolet radiations. However, many such inks already in use need a special surface that is “UV bland” to be effective. In other words, they need a special paper that itself does not glow under UV light.

The ink developed by Bipin Gupta’s team however does not need such special surfaces. “It is printable on all papers and surfaces,” exudes Dr. Gupta. Not only that, the ink can be tested both under UV and Infrared lights. This dual-mode glowing by the ink adds to its secure nature making it doubly counterfeit proof. The “ink is formulated from a cost-effective dual-mode luminescent composite pigment”, says Dr. Gupta. It is prepared by a combination of rare earth elements like

Security inks are essential and crucial for printing of currency. They help prevent any counterfeits, and in such an event make their detection easy.



Prints using the new security ink appear differently under normal light (a) and under UV light (b)



Gadolinium, Ytterbium and Erbium oxides with phosphors such as Zinc and Manganese Sulphide.

Gupta's team has judiciously mixed these two complex chemicals to get a pigment. The resulting pigment can be mixed in the PVC gold medium used in the manufacture of ordinary inks. The rare earth metals are in the form of nanorods and respond to near infrared laser while the phosphors respond to UV light. "The composite pigment can be excited with two wavelengths – in ultraviolet light (365 nm, UV lamp) and 980 nm with Near-infrared laser. The nanorods emit red light upon excitation with 980 nm laser and phosphors emit yellow light upon exposure to 365 nm UV lamp. The ink designed by Gupta's team shines bright yellow under UV and intense red when under IR.

"We have plans to replace NIR laser with NIR LEDs in future to make a cost-effective excitation source," says Dr. Gupta. That would make the lamps cheaper and easy for manufacturing.

The composite pigments in the ink, Gupta says, are "tunable and thus more secure". Meaning that the pigments

responding to specific excitation wavelengths and that emit specific wavelengths of light are possible. This makes it extremely difficult to counterfeit," explains Gupta. In other words, patterns that appear identical on paper or on different currencies may glow differently when exposed to a selected and specific frequency of light. Besides making currency secure, these novel inks can also be used in "printing labels of pharmaceuticals or in printing important documents" says Gupta.

With the patent pending, the ink's availability in the market may not be too distant. It would then be another unique gift from the National Physical Laboratory which gave us the indelible ink to ensure a free franchise.

A.S.K.V.S. Sharma,
CSIR-CFTRI, Mysuru

Reference:

Kanika et al., A Novel Approach to Synthesise a Dual-Mode Luminescent Composite Pigment for Uncloneable High-Security Codes to Combat Counterfeiting, *Chem. Eur. J.* 2017, Vol. 23, Pp 17144 – 17151, 2017 (DOI: 10.1002/chem.201704076)

Natural Composite for Stronger Bone Grafts

Researchers from the Advanced Materials and Processing Division at the CSIR-National Metallurgical Laboratory (CSIR-NML), Jamshedpur have developed a novel nanocomposite that has shown potential to be used as a regenerative bone graft especially in regions that need high strength.



Researchers from the Advanced Materials and Processing Division at the CSIR-National Metallurgical Laboratory (CSIR-NML), Jamshedpur have developed a novel nanocomposite that has shown potential to be used as a regenerative bone graft especially in regions that need high strength.

The nanocomposite was synthesised through a simple and cost-effective route. The composite contains carboxymethyl cellulose, gelatin and hydroxyapatite, with the hydroxyapatite in nanoscale (25-10 nm size).

Since bone grafts to be used in load-bearing applications must match the strength of the natural bone, the researchers evaluated the strength and elasticity of the nanocomposite and found it to be in the same range as human cancellous and cortical bone.

In the paper published in the *Journal of Materials Science*, the authors inform that since all bone grafts need

to be steam sterilised before use, the substance should be able to withstand at least 120 degree C. The new polymer nanocomposite is thermally stable up to 200 degree C, they say. It is biodegradable and also accelerates the formation of new bone apatite under simulated body fluid.

Human bone cell line (MG-63) cells were also found to be biocompatible and proliferated in the presence of the nanocomposite. In fact, the nanocomposite accelerated the bone cell line for new bone tissue formation.

Often the risk of transferring diseases and chances of biological rejection from the host body are very high in the case of bones transplanted from others (allograft). On the other hand, metallic implants have high mechanical strength and mismatch with natural bone causing stress shielding and bone loosening which may damage or fracture adjacent bones.

The researchers say that the compressive strength and modulus of the nanocomposite developed by them is in the range of human bone. So, there is no risk of damage to adjacent bones

after implantation. The nanocomposite gets absorbed inside the body and new bone is formed in that place. And unlike metallic implants, there is no need to take out the new implants.



Artificial Small Intestine Helps Study Nutrient Absorption from food

In a development that promises to overcome ethical issues in research, scientists from the Central Food Technological Research Institute (CSIR-CFTRI), Mysuru, and the Indian Institute of Food Processing Technology (IIFPT), Thanjavur, have developed an artificial small intestine system to test the level of absorption of micronutrients and other bioactive compounds from food.

The artificial system consists of a perfusion chamber fitted with rat intestine and requires just two hours to analyse the intestinal absorption. Methods currently in use are time-consuming and not suitable for studying large number of compounds.

The artificial intestine system, which cost Rs 20 lakh to develop, simulates the exact physiological conditions and helps to evaluate both bioaccessibility and bioavailability of nanoformulated bioactive compounds. The system has reduced the number of rats required for animal trials from 6-10 rats to just 2-3 thus taking care of the ethical issues that researchers face in carrying out *in vivo* studies.

The researchers checked the permeability of both fat-soluble (vitamin E) and water-soluble (gallic acid) compounds using the new set-



up. While in the case of the fat-soluble compound, the permeability was higher in rats than the new system, the artificial system performed better for the water-soluble compound.

Studies on Consolidation & Deformation Characteristics of Ordinary & Geosynthetic Encased Stone Column Improved Soft Soil: CSIR-CBRI, Roorkee

The effect of stress concentration ratio will give the clear guidelines for predicting load improvement and settlement factors which makes the treatment method economically beneficial.

The present study carried out at CSIR-Central Building Research Institute (CSIR-CBRI), Roorkee sought to improve the load carrying capacity of soft soil treated with ordinary and encased stone columns. In addition, the load sharing between the soil and stone column was also studied to evaluate the stress concentration ratio between the surrounding soil and stone column when subjected to external loading. The effect of stress concentration ratio will give the clear guidelines for predicting load improvement and settlement factors which makes the treatment method economically beneficial.

Model Test

Usually the stone columns are installed in triangular or square pattern in such a manner that each column influences certain area of soil, called unit cell. As unit cell is representative of an area treated with stone columns, it was decided to carry out unit cell experiments in the present study. The experiments were carried out to estimate the load carrying capacity of ordinary and encased stone column installed in soft clay. For this, unit cell having inner diameter of 185 mm and height of 600 mm height was used.

Three stone columns of diameters 63 mm, 76 mm and 88 mm with an area replacement ratio of 11.6 %, 16.9 % and 22.6 %, respectively were selected for evaluating the load carrying capacity of stone columns and stone column

improved soft soil. The clay soil used for the study was classified as CL as per IS classification system. The liquid limit and plastic limit of the soil were 34.5 % and 23.5 %, respectively. The stone aggregates used to form the stone columns are angular in nature, of size 2 to 10 mm and have uniform gradation. The stone aggregate in all the tests was compacted to a dry unit weight of 16.2 kN/m³ corresponding to a relative density of 60 % representing field situation.

Based on the unconfined compression tests on clay samples, water content of 28 % was selected for meeting the required shear strength of 15 kPa which simulates the soft clay characteristics in field conditions. The clay was dried for 24 hours and then pulverized and mixed with required quantity of water and finally filled in the test tank. The soil was then filled inside the test tank in five layers and each layer was properly compacted with a hammer of 4.5 Kg to achieve a compacted height of 120 mm with uniform density. After the preparation of clay bed, installation of stone column was performed.

The installation procedure begins with bore-hole formation, which involves removal of soil from unit cell by placing a casing pipe having diameter equal to that of selected stone column diameter. Then the pipe was pushed vertically inside the prepared clay soil and the soil inside the tube was removed carefully leaving hole at the centre.



Fig. 1. View of stone column and unit cell



Fig. 2. View of stone column and location of earth pressure cells

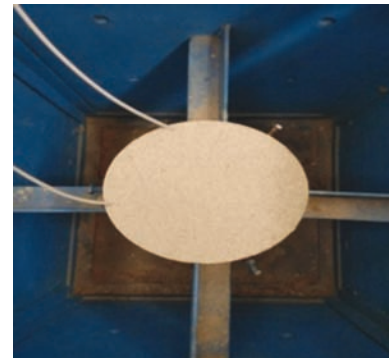


Fig. 3. Granular blanket for load distribution

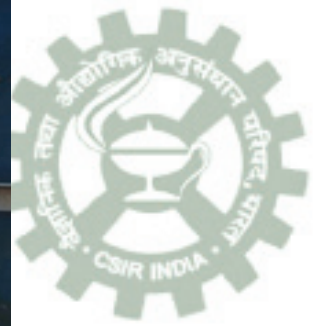


Fig. 4. View of complete load test set-up

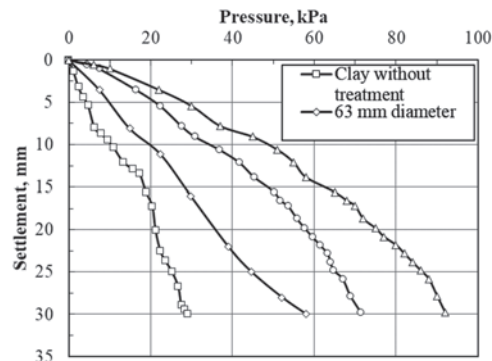


Fig. 5. Load test results for different stone columns (surface loading)

Then the bore hole gets replaced with stone chips filled in stages to 120 mm thickness and compacted to achieve a dry unit weight of 16.18 KN/m^3 . The completed view of constructed stone column is shown in Fig. 1. For measuring load distribution mechanism two earth pressure cells were used. One earth pressure cell was placed at the centre of stone column and other one at soil surface. The position of earth pressure cells is shown in Fig. 2. After placing earth pressure cells, sand cushion having thickness of 30 mm was placed before starting load tests (Fig. 3). Then load tests were performed to evaluate the load carrying capacity of stone columns.

Two types of tests were performed viz. column alone loading where the stone column get loaded with a plate having diameter equal to that of column diameter and other one is surface loading in which the entire cell

is loaded with a loading plate having diameter equivalent to that of cell diameter. Typical photograph showing the details of surface loading is shown in Fig. 4. Settlement during loading is measured using dial gauges having 0.01 mm accuracy.

Fig. 5 shows the surface load test results of columns with diameters: 63 mm, 76 mm and 88 mm. At a settlement of 10 mm the increase in load carrying capacity for the corresponding diameter of stone columns of 63 mm, 76 mm and 88 mm is found to be 2, 3.6 and 5.1 times respectively for the untreated clay soil. Similarly, the increase in ultimate load carrying capacity is found to be 2, 2.45 and 5.1 times, with that of untreated clay soil. It can be seen that both load carrying capacity and stiffness increases with increase in diameter of stone columns.

S. Ganesh Kumar & M. Samanta
CSIR-CBRI, Roorkee

CSIR-NISCAIR-DST National Workshop

“Science, Technology & Innovation Policy: Optimising Communication & Information Research”



Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR addressing the gathering. On the dais (from right) Dr. H. Purushotham, Chairman and Managing Director, National Research Development Corporation (NRDC); Prof. K.K. Dwivedi, Vice Chancellor, ITM University, Gwalior; Dr. R.S. Sangwan, Director, Academy of Scientific and Innovative Research (AcSIR); Dr. Neeraj Sharma, Head and Advisor, Policy Research, DST; Dr. Akhilesh Mishra, Senior Scientist, Policy Research, DST

Science and technology policies play an important role in shaping a country's research and development. India has had a few science and technology policies since independence that have shaped science and technology in the country. The latest policy in place is the Science, Technology and Innovation Policy of 2013. Devising science, technology and innovation policies requires considerable inputs and envisioning future needs so that such evidence-based policies can

foster scientific research, accelerate technological developments and create innovative products and processes.

In view of the need for optimizing communication and encompassing information research when crafting science, technology and information policies, the CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR), organised a national workshop on “Science, Technology

& Innovation Policy: Optimising Communication & Information Research” during 23-25 January 2018 at the NASC Complex, New Delhi in collaboration with the Department of Science and Technology, Government of India. About 100 participants including scholars, researchers, scientists, practitioners, policy makers and students from all parts of the country participated in the workshop.

Addressing the participants and invitees during the workshop’s inaugural function, Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR stated that the workshop’s aim was to provide insights and underscore the interventions of communication and information research while devising and implementing the science, technology and innovation, policies, plans and strategies.

Dr. Neeraj Sharma, Head and Advisor, Policy Research, Department of Science and Technology who was Guest of Honour, highlighted the importance of data and evidences in devising STI policies. Dr. H. Purushotham, Chairman and Managing Director, National Research Development Corporation (NRDC) said that suitable communication strategies are vital to

make STI policies more effective. He also stressed on the important role of social media as a communication platform.

Prof. K.K. Dwivedi, Vice Chancellor, ITM University, Gwalior who was the Chief Guest of the inaugural session, said that policy implementation is as important as policy making to make the STI policy a successful one. Prof. Dwivedi delved on strengthening the industry-academia R&D ecosystem to promote a culture of innovation in the country. He added that this is possible through linkages between universities and national research laboratories.

Chairing the inaugural session Dr. R.S. Sangwan, Director, Academy of Scientific and Innovative Research (AcSIR) stated that needs of the common man should be kept in mind while preparing policies and inculcating scientific temper in the society should be integrated into policy initiatives.

Dr. Akhilesh Mishra, Senior Scientist, Policy Research, Department of Science and Technology proposed the vote of thanks.

Launch of CSIR-NISCAIR Mobile App

CSIR-NISCAIR, keeping pace with information technology development and trends, launched its mobile app on the occasion. Introducing the ‘CSIR-NISCAIR Mobile App’, Mr. C.B. Singh, Senior Principal Scientist and Head, Information Technology Division, CSIR-NISCAIR stated that the mobile app is a handy tool to access all CSIR-NISCAIR research journals and popular science magazines. A demonstration of the App was also given following which the dignitaries released the mobile app.

Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR added that the App would make science



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Dr. Neeraj Sharma, Head and Advisor, Policy Research, DST

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Launch of the CSIR-NISCAIR Mobile App

communication efforts of the Institute even more effective. The app also has a social media button, which allows users to connect with NISCAIR through various social media websites.

Panel Discussion on “Understanding STI Structure in India”

The inaugural session was followed by a panel discussion on “Understanding STI Structure in India”, which was chaired by Prof. Rupinder Tewari, Panjab University, Chandigarh who stated that policy implementation was more difficult than devising policies.

While Dr. V.P. Singh, President, Indian Science Communication Society (ISCOS) spoke about human resource development programmes in science communication and stressed on aligning policy initiatives to help farmers in the country, Dr. Anil Saumitra of Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal said that a balance between STI policy, humanity and R&D is

vital and stressed on the need to use local languages for wider dissemination of the STI policy.

Dr. Balram Pani of Bhaskaracharya College, Delhi University expressed his view that science should blend with innovation and that interest of the masses should be kept in mind so that policy makers can make an inclusive policy. Dr. Deepak Gupta of the Himachal Pradesh Council for Science and Technology spoke about various science communication and popularization activities of the Council. Dr. Sandeep Singhal, Senior



Prof. Rupinder Tewari, Panjab University



Dr. Anil Saumitra, Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal

Scientist, CSIR-CSIO (Central Scientific Instruments Organisation) spoke on peer-to-peer science communication.

Communication Implication & Opportunities

Dr. R.K Bhandari, Former Director, CSIR-Central Building Research Institute (CBRI), Roorkee chaired the session on “Communication Implications and Opportunities”. In his opening remarks, Dr. Bhandari shared his concerns related to the communication strategies and suggested that better communication strategies need to be formulated to make STI policy more effective. Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR who was co-chair of the session emphasized the need for evidence-based policy.



Dr. R.K Bhandari, Former Director,
CSIR-Central Building Research Institute,
Roorkee

Speaking on the role of private universities in science communication, information science and planning, Prof. Mayur Yergeri of NMIMS University said that the policy framework should strongly address open innovation. Dr. P.S. Navaraj, Former Principal, Annai Fathima College of Arts and Science Madurai, spoke on the science of science communication. Dr. Jyoti Yadav, Head, PME, CSIR-Institute of Genomics and Integrative Biology (IGIB) said that

there seemed to be a lack of connect and collaboration when it came to communication strategies. She was of the view that IT tools need to be better harnessed to strengthen communication. Dr. Nadeem Bashir of the Government College for Women, Srinagar stated that for enhancing science communication in J&K, ICT implementation in the state needs to be improved. Others who spoke during the session included Dr. Atul Kumar Agarwal, Senior Principal Scientist, CSIR-Central Building Research Institute and Dr. Ruchi Singh Gaur, Amity University.

STI Policies: Global Scenario and Comparative Analyses

Dr. K.J. Ramesh, Director-General, India Meteorological Department chaired the session on “Global Scenario and Comparative Analyses of STI Policies”. Dr. Jagdish Chander, Department of Science and Technology, New Delhi who was the lead speaker of the session said that research and survey inputs and data collection from target and stakeholder groups is an essential part of developing science policies. Dr. Chagun Basha, Centre for Policy Research, Indian Institute of Science,



Dr. Chagun Basha, Centre for Policy
Research, Indian Institute of Science,
Bengaluru





Dr. G. Mahesh, CSIR-NISCAIR



Dr. Mahruf Orewale, National Centre for Technology Management, Nigeria



Ms. Kirti Sharma, Central University of Gujarat

Bengaluru, Dr. G. Mahesh, CSIR-NISCAIR, Ms. Kirti Sharma, Central University of Gujarat and Dr. Mahruf Orewale, National Centre for Technology Management, Nigeria were the other speakers of the session.

Innovative Tools, Modes & Means

Dr. P. Goswami, Director, CSIR-NISTADS chaired

the session on innovative tools, modes and means. In his opening remarks, he said that innovation related to science should be properly narrated. Dr. R.S. Beniwal, Senior Principal Scientist, CSIR-NISCAIR suggested that policies should be formed on the basis of data, evidence and proper analysis. He mentioned that cultural theory or grounded reality is mostly ignored while shaping science policies. There is a need to come up with customised policies and problems should be discussed related to policy making, he added.



Dr. P. Goswami, Director, CSIR-NISTADS (Chair) and Dr. R.S. Beniwal, Senior Principal Scientist, CSIR-NISCAIR (Co-chair)

Pre- and Post-STI Policy Impact: Information Analytics

In the session on impact of STI Policy, Dr. Sanjay Mishra, Scientist, Department of Science and Technology spoke on less coverage of science in newspapers and magazines and suggested that science communication should be introduced in the undergraduate curriculum. In his talk, Dr. Venkatesh Dutta, Babasaheb Bhimrao Ambedkar University, Lucknow said that cultural theory or grounded reality is mostly ignored while shaping science policies. There is a need to come up with customised policies, he said.

Science Communication Research & STI Policy

Dr. V.K. Srivastava, President, Indian Science Writers Association while chairing the session on science communication research and STI policy suggested that the Industry Academia ecosystem in India which is essential to promote the innovation scenario in the country should be strengthened. Giving his views on science communication research and STI Policy Dr. B.K. Tyagi of Vigyan Prasar, New Delhi said that science communication is not yet



Dr. Venkatesh Dutta, Babasaheb Bhimrao Ambedkar University, Lucknow

recognized as an academic course in India and there is a need to enable and strengthen channels of communication between the scientific community and policy makers.

Information & Informatics Support

Dr. Ajay Pratap Singh from Lucknow University chaired the session on information and informatics support. Speaking on science, technology and innovation (STI) policy in the context of tribal indigenous knowledge in India,



In the session on impact of STI Policy, Dr. Sanjay Mishra, Scientist, Department of Science and Technology spoke on less coverage of science in newspapers and magazines and suggested that science communication should be introduced in the undergraduate curriculum.



Dr. B.K. Tyagi, Vigyan Prasar



Dr. T.K. Jana, CSIR-NISCAIR



Dr. Ajay Pratap Singh from Lucknow University (Chair) and Mr C.B. Singh, Senior Principal Scientist, CSIR-NISCAIR (Co-chair)

Dr. Singh shared his concern about policy lacunas. Dr. K. Raghu Babu of Andhra University, Visakhapatnam said that policy benefits should reach villages.

Ms. CharuVerma, Principal Scientist, CSIR-NISCAIR, New Delhi, presented her work under the title “BIG DATA: Transforming Governance for Inclusive Society”. She informed that the current work is in line with the Technology Vision 2035 that includes “Leadership in ICT: Towards Transforming India into a Digitally Empowered Society and Knowledge Economy”.

She summarized the science and technology policy implications and imperatives like global uniform standards for ensuring data quality, define data ownership for different set of healthcare services, new set of rules for data privacy and finally education to

remove the dearth of skills and talent for data analytics.

Roundtable Discussion

A highlight of the workshop was a roundtable discussion on the topic, “Towards a Comprehensive Indian STI Ecosystem” chaired by Dr. Sunil Kumar Agarwal, SEED Division, Department of Science and Technology, New Delhi. Prof. M. Sai Baba, Principal Scientist, NIAS, Bengaluru and Dr. Ram Aasre, Principal Scientist, IARI, ICAR, Delhi were the experts.

To set the context of the discussion, Dr. Sunil Kumar Agarwal showed a film titled “Light of hope: Let the light spread with positivity and hope” that made the audience aware of how slum dwellers devoid of basic natural resources such as natural light, live in darkness even during day time. He made the workshop participants aware about the various solar technologies promoted by DST benefitting the slum dwellers and the rural masses. He said that DST is making efforts to connect different groups and various technologies with the rural sector and that the Team SEED of DST is endeavoring to scale up green tech solutions.



Ms. CharuVerma, Principal Scientist, CSIR-NISCAIR



Prof. M. Sai Baba, Principal Scientist, NIAS, Bengaluru

Prof. M. Sai Baba, Principal Scientist, IAS, Bengaluru gave his views for a comprehensive Indian STI ecosystem. For this, highly skilled and motivated manpower is essential to make the country progressive in all domains and innovation is the key to solving many of the societal problems, he opined.

Dr. Ram Aasre, Principal Scientist, IARI, stated that through suitable policy interventions, there has been steady progress in the agricultural sector in general. Dr. Ravi Agarwal spoke about CSIR-NAL's achievement of successfully flying its 14-seater indigenous aircraft SARAS on 24 January 2018. He said that the lightweight aircraft that consumes lower fuel could be used for a variety of purposes.

Summing up and Closing

Dr. P. Goswami, Director, CSIR-NISTADS, Dr. Prabhat Ranjan, Executive Director, TIFAC, Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR, Prof. Krishan Lal, Co-Chair,

IAP for Science and Former President, INSA, Dr. Akhilesh Mishra, DST and other prominent guests joined the workshop's valedictory function.

Prof. Krishan Lal who was the chief guest of the event spoke at length about the need for a robust STI policy and how science and technology led innovation can be a major driver of national development. He stressed on "high-quality science for innovation" and emphasized on the inclusion of people with a strong science background for designing robust STI policies. Dr. Akhilesh Mishra highlighted the need for connecting science to society. Dr. P. Goswami focused upon the innovation part of STI policies and suggested various measures to achieve it. He pointed out the significance of communication in achieving these goals with a well-planned strategy.

Dr. Prabhat Ranjan discussed the "Technology Vision Document 2035" which is being prepared by TIFAC. The Vision Document envisages the technologies to be developed to fulfill



(From right) Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR; Dr. P. Goswami, Director, CSIR-NISTADS; Mr. Jayant Sahasrabudhe, Organising Secretary, VIBHA; Prof. Krishan Lal, Former President, INSA; Dr. Prabhat Ranjan, Executive Director, TIFAC, and Dr. Akhilesh Mishra, DST at the workshop's valedictory function

the needs of every Indian. He said that both technology development and its diffusion should occur at a breakneck pace.

A new episode of Science Wience “Say Hello to Virus – On extreme edge of life” made by a professional Mr. Ashutosh in partnership with TIFAC was launched by Prof. Krishan Lal. This video is now available on YouTube and Facebook.

Mr. Jayant Sahasrabudhe, Organising Secretary, VIBHA while chairing the session said that people and decision-makers should be aware of the implications of emerging technologies and that is where science communicators and scientists have a role to play. He emphasized the role of

effective communication in achieving this objective by disseminating the scientific information to masses in regional languages.

In his concluding remarks, Dr. Manoj Kumar Patairiya stressed on the need to connect public, industries and policymakers to develop robust science, technology, and innovation policy. He said that ‘connecting’ everyone is the keyword and there should be a conglomeration of people from all walks of life. He mentioned that policymaking should be based on data and demand.

*Report compiled by Disha Berry,
Famida Khan, Swasti Malik, Vaishali,
Vishaka & G. Mahesh*

National Conference on SC/ST Contributions to S&T Organised at CSIR-NAL

The second “National Conference on Contributions of SC/ST Scientists and Technologists towards Advancement of Science and Engineering (NCSCSTASE2018)” was organized by CSIR-National Aerospace Laboratories (NAL), Bangalore from 23-25 January 2018.

Shri L. Murugan, Vice-Chairman, National Commission for SC, New Delhi graced the occasion as the Chief Guest. Prof. Karisiddappa, Vice Chancellor, Visvesvaraya Technological University, Belgaum, Karnataka was the Guest of Honour and Shri V.V.R. Sastry, Former CMD, Bharath Electronics delivered the Keynote Address. Shri Jitendra J Jadhav, Director CSIR-NAL/Chairman of the conference presided over the function.

The conference was held over three days comprising of inaugural keynote address, two plenary lectures, 19 invited lectures and 65 contributory papers from SC/ST scientists, technologists, academicians and research scholars from all over the country. The research papers from different themes were presented in 20 technical sessions. The conference had about 250 participants from R&D organizations/centres, academia and industries. This forum provided an opportunity to SC/ST scientists, technologists, academicians and research scholars for discussion and further advancement of Science, Engineering & Technology in the country for the future requirement of nationally important and major R&D programmes.



राष्ट्रीय सम्मेलन / National Conference
 on
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CSIR-CBRI Celebrates its Foundation Day

CSIR-Central Building Research Institute (CSIR-CBRI), Roorkee celebrated its 72nd Foundation Day on 10 February 2018. Prof. N. Raghavan, Professor of Practice, IIT Madras & Chairman, Research Council, CSIR-CBRI Roorkee graced the occasion as Chief Guest and Mr. Kamal Kishore, Member, National Disaster Management Authority, New Delhi was the Guest of Honour. Dr. N. Gopalakrishnan, Director, CSIR-CBRI, Roorkee presided over the function.

In his Presidential Address, Dr. N. Gopalakrishnan expressed his gratitude and best wishes to everyone who had directly or indirectly made a contribution in this glorious journey of the Institute. He said that even though the Institute faced a great deal of difficulties, it has risen up to the challenge through its resilience and dedication. He assured that the Institute will continue to serve the nation by carrying out R&D in all aspects of housing and assisting the building industry.

Addressing the gathering, Prof. N. Raghavan, Chairman, RC said that CSIR-Central Building Research Institute, Roorkee is the crown jewel of civil engineering and has made unprecedented contributions for the growth and development of the nation. He encouraged the scientists and staff of the

Institute to build sustainable, safe, cost-effective and durable cutting-edge building techniques. He appealed to the scientists to be prepared for the upcoming challenges through discipline and self-introspection.

Dr. Kamal Kishore in his address complimented CSIR-CBRI, Roorkee for making its mark on the whole world through its achievements. He said that the fingerprint of CSIR-CBRI can be found across the globe as they take inspiration from the R&D works of the Institute like reconstruction of villages after Uttarkashi earthquake by building Kedar Kutir, fire protection measures for



Chief Guest Prof. N. Raghavan



Dr. A.K. Minocha



Dr. N. Gopalakrishnan



Dr. Suvir Singh



Dr. Kamal Kishore



Science exhibition



Release of CBRI Newsletter

Salar Jung museum, etc. He encouraged the Institute to transit from pilot projects to large scale projects, engage with the industry and make them reach the general public.

The Institute was open for the students of the schools and colleges of Roorkee and the public at large. The students of Kendriya Vidyalaya No. 1 and Kendriya Vidyalaya No. 2 participated in the Science Exhibition under the “Jigyasa-Quest for Curiosity” student scientist connect programme.

Students from Kendriya Vidyalaya No. 1 Ravi and Kamal presented “Stress Monitoring in Students” App and “Survivors Wheels”App; Amogh and Chahal presented a model on “Natural Resources”; Simran and Harsh demonstrated “Ecosan Toilets” and

“Utilization of Biodegradable Waste from Train Toilets”; and students from Kendriya Vidyalaya No. 2 Ismiti Bisht and Prachi Kashyap displayed their model on “Resource Management”; Abhishek, Akash and Ankit demonstrated a model of “Air Filter”; Sachin Bisht and Ravish presented a model on “Fire Disaster Management”; Upwan Pundir and Vibha Chauhan demonstrated a model on “Water Body Conservation and Waste Management”.

The latest edition of CSIR-CBRI’s quarterly bilingual CBRI Newsletter Bhawnika and Nirmanika were also released on the occasion. The Exhibition also displayed the technical achievements of the Institute through the display of the Institute’s publications including the Institute’s Technical

Brochures, Building Research Notes, Annual Reports, Newsletters, etc.

On this occasion, the Diamond Jubilee Director's Award for Best Research Paper of Rs. 15,000/- and a citation was awarded jointly to Dr. Anindhya Pain, Mr. V.S. Ramakrishna and Dr. S. Sarkar for the paper titled "Seismic Transition Failure Analysis of MSW Landfill using Pseudo-Dynamic Approach" and Dr. L.P. Singh, Mr. W. Zhu and Ms. Usha Sharma for the paper titled "Quantification and Characterization of C-S-H in Silica incorporated Cementitious System".

The Diamond Jubilee Director's Award for Development of Best Technology which has Maximum Impact on the Society of Rs. 10,000/- and a citation was awarded to four technologies: "Design of High Draught Brick Kiln" by Mr. E.S. Heera Lal, Dr. A.K. Minocha, Mr. S. Maiti, Dr. Neeraj Jain and Mr. Vivek Sood; "Building Products using Kota Stone" by Dr. Rajni Lakhani and Mr. Rajesh Kumar; "Boring Machine for making Horizontal Bores under the Ground" by Dr. S.K. Panigrahi, Mr. Narendra Kumar, Mr. R.S. Bisht and Mr. Sameer; and "Technology for Coal Ash Utilization through Geopolymer Concrete for In-Situ Construction" by Ms. G. Ishwarya, Ms. Humaira Athar, Mr. Rakesh Paswan, Md. Reyazur Rehman,

Mr. Jeeshan Khan, Mr. S.K. Singh and Ms. Sandhya Deshwal.

Mr. V.P.S. Rawat, Security Officer and Mr. Sudhir Sharma, Ex- Technical Officer were awarded a Samman Patra and a Trophy in recognition of Excellence in sports at State level in the age category of 50+ and at International level in the age category of 61-72 respectively. A Samman Patra and a cash award of Rs. 3000/- was awarded to Mr. Raj Singh, Security Guard in recognition of his sincere and extra vigilance in performing his duties in the year 2017-2018.

A Debate Competition was organized under the supervision of Mr. Aman Kumar on the topic "Social Media – A Boon or a Curse" in which Mr. Arpan Maheshwari stood first, Mr. Sushil Kumar stood second and Mr. Saksham Bhardwaj received the third prize. An Essay Writing Competition on the topic "Women Empowerment: Key to National Development" was organized wherein Dr. Atul Kumar Agarwal stood first, Mr. Ashish Kharkwal second and Dr. Rajni Lakhani received the third prize.

Dr. A.K. Minocha, Chief Scientist, conducted the proceedings and presented the formal introduction of the Chief Guest. Dr. Suvir Singh, Chief Scientist presented the formal introduction of the Guest of Honor and proposed a vote of thanks.

Students of various schools, superannuated staff of CSIR-CBRI and all the staff members of the Institute also witnessed the occasion besides other dignitaries.



Printed and Published by

Dr. Manoj Kumar Patariya on behalf of CSIR-National Institute of Science Communication And Information Resources

Dr. K.S. Krishnan Marg, New Delhi -110 012 and printed at NISCAIR Press

Dr. K.S. Krishnan Marg, New Delhi -110 012

Editor : Hasan Jawaid Khan; **Assistant Editor :** Sonali Nagar

Design: Neeru Sharma & Sarla Dutta; **Production:** Pankaj Gupta

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Website: <http://www.niscair.res.in>

Please direct all Subscription-related queries to:

Sales & Distribution Officer, NISCAIR; E-mail: sales@niscair.res.in; Phone: 25843359

Annual Subscription: Rs 500; Single Copy: Rs 50.00

RN 4512/57