

CSIR-NISTADS

ANNUAL REPORT

CSIR: 75 YEARS OF
TOUCHING LIVES
A SURVEY OF PEOPLE'S
PERCEPTION



Report of analysis
based on Survey
conducted during
CSIR Platinum
Jubilee Technofest
2016 at IITF,
Pragati Maidan

K. Mandal, S. Gupta

Vitarka
A CSIR-NISTADS Outreach Programme for Policy Debate
India will support large homogeneous agriculture
small holding diversified agriculture

28th July 2016
Vatika International Centre, New Delhi

Vitarka
Policy Debate
on
Homogenous vs.
Diversified Agriculture

28th July 2016
Vatika International Centre
New Delhi

PUBLIC OUTREACH

2016-17

CSIR-NISTADS Mission Carbon-Delhi
Reduction of Atmospheric Carbon through
Non-Disruptive Sustainable Sequencing

PROOF OF CONCEPT

Ayur Vatika
आयुर्वतिक

STUDENTS OUTREACH

SUSTAINABLE
DEVELOPMENT

BRICS
Science & Technology
Enterprise Partnership

Bold, Responsive, Inclusive and Cohesive
Solutions for Rapid Transformations

POLICY

National Institute of Science, Technology and Development Studies
Council of Scientific and Industrial Research
New Delhi



Annual Report 2016-2017



**CSIR-National Institute of Science, Technology and
Development Studies**

Pusa Gate, K.S. Krishnan Marg, New Delhi

© CSIR-NISTADS: CSIR-National Institute of Science, Technology and Development Studies

Pusa Gate, K.S. Krishnan Marg, New Delhi 110012

Website: <http://nistads.res.in>

Email: director@nistads.res.in

Phone: +91 11 25846064, 25843227 Fax: +91 11 25846640

Editor-in-Chief
Dr. P. Goswami

Editorial Team
1. Dr. Vipin Kumar
2. Dr. Praveen Sharma
3. Anil Sharma

CONTENTS

1.	From Director's Desk	1
2.	About CSIR-Nistads	3
3.	Research Projects	7
4.	CSIR Network Project	14
5.	Academy Of Scientific And Innovative Research (ACSIR)	17
6.	Publications	21
7.	Lectures/Conference Presentations	25
8.	Staff News	26
9.	Workshops, Conferences and other Events	29
10.	Lectures Organised	39
11.	BITS Seminar	40
12.	OUTREACH PROGRAMME	43
	• TECHNO-FORESIGHT: Technology of Future	43
	• VITARKA: Policy Debate	46
13.	CSIR-NISTADS in News	53
14.	Project Monitoring & Evaluation (PME)	59
15.	Library	60
16.	IT Infrastructure	61
17.	Research Council	62
18.	Management Council	64
19.	Right To Information Act (RTI) Cell	65
20.	Budget	66
21.	हिंदी की गतिविधियां	69
22.	Staff List	73

FROM DIRECTOR'S DESK



Since its inception, CSIR-National Institute of Science, Technology and Development Studies (CSIR-NISTADS) has provided a critical link, and the only CSIR laboratory, to serve as a channel between social, natural and engineering sciences in CSIR as well as within the broad R&D system of the country. Following its Repositioning as per the directive of DG-CSIR and the recommendations of the NISTADS Research Council in 2015, NISTADS has further strengthened and revised its mandate and vision to serve the nation with renewed energy. The year 2016-17 has seen several impactful efforts along these lines, which are reflected in this Annual Report.

At the core of NISTADS' mandate is research and activities associated with Science, Technology, Innovation and Development. The focus now is on translational projects to expedite the transfer of benefits from R&D to the general populace and the Indian industry. It was also realized that policy advisories need to be strictly evidence-based for their acceptability, and preferably with demonstrated proof-of-concept for establishing their implementability.

NISTADS has initiated several projects along these lines.

A notable effort of NISTADS to advocate low-carbon development pathways has been through the project on 'Reduction of Atmospheric CO₂ over Delhi through Non-Disruptive and Sustainable Carbon Sequestration: System Design and Proof of Concept'. The findings from this project have been now presented as policy advocacy for implementation. Similarly, the project on 'Design of Policy Advocacy and Intervention for Control of Air Pollution over Delhi through Comprehensive Quantitative Analysis' was carried out for the development of evidence-based mitigation solutions. Other notable efforts include Scientometric Approach to Study Arsenic, Fluoride, Nitrate and other Heavy Metals in Drinking Water and Treatment Alternatives for Removal of Contamination and providing policy advisory for sustainable groundwater solution.

Evidently, such 'translation' of R&D also requires precise and continuous inputs from the user agencies. CSIR-NISTADS has reached out and incorporated user requirements to its programmes through close contacts and regular interactions with agencies like National Institution for Transforming India (NITI) Aayog and the Indian Council of Medical Research for the upkeep of these programmes with user inputs.

During the period, CSIR-NISTADS organized two significant workshops: one on 'Opportunities and Challenges for Regional Innovation System (OCRIS); and the other, jointly with the National Institute

of Advanced Studies (NIAS), Bangalore, on 'Indian Science & Technology Entrepreneurship Partnership (ISTEP)' in New Delhi under the Indian S&T and Innovation Policy (ISTIP) Project. To mark the CSIR-NISTADS Foundation Day on the 30th of September, 2016, a discussion meeting on 'Social Dynamics Prediction System' was held at the Institute. Also, two meetings each of the Research Council and Management Committee were held during the year. The recommendations of these meetings are now being actively followed.

The Institute remains committed to generating and disseminating knowledge on science, technology, innovation and related topics and their applications along with policy implications. Several Outreach Programmes were planned and launched as well. Public Discussion forums (i) TECHNO-FORESIGHT: Technology of Future; and (ii) VITARKA: were launched on the Technology Day on May 11, 2016.

Five lectures were organised in Techno-Foresight series, and five debates were held

under the policy debate programme Vitarka. These events received good public response and media coverage.

The energetic doctoral and students programme at CSIR-NISTADS continues, with students pursuing doctoral degrees in research areas like Quantitative Research Methodology; Science, Technology & Innovation Policy and Intellectual Property Rights.

I am grateful to the Chairman and the members of the Research Council for their valuable guidance and inputs for enabling us to achieve the challenging task of repositioning NISTADS and unveiling many new initiatives. Thanks are also due to the Director General, CSIR, and other Divisions of CSIR HQ, for their valuable inputs and support. Finally, I extend my thanks to all the members of CSIR-NISTADS for their active participation in the Institute's activities.

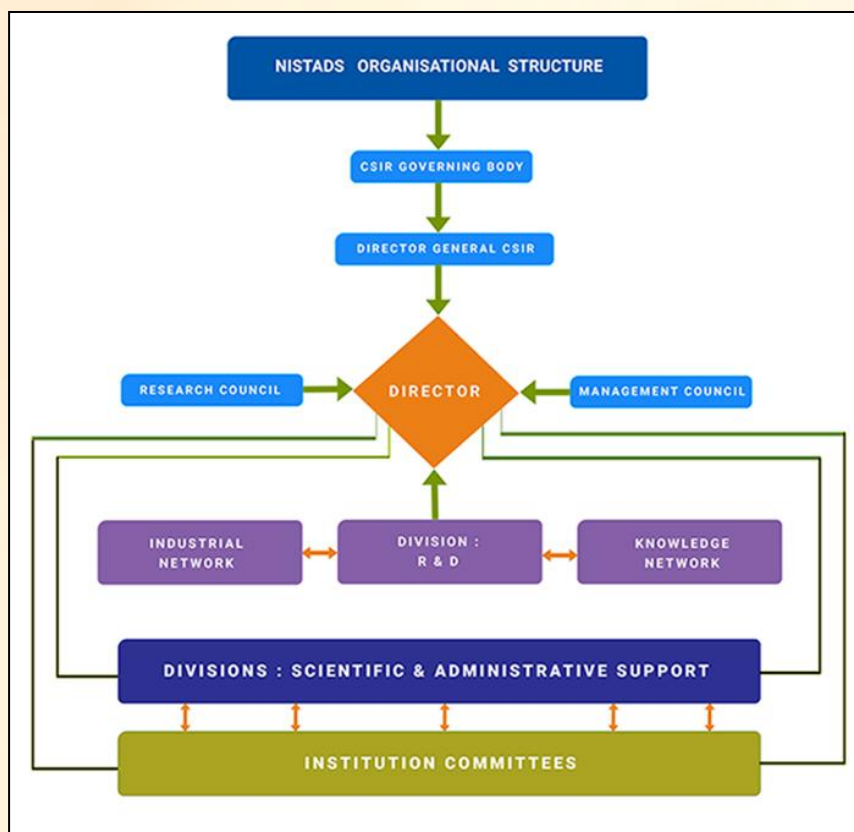
Dr Prashant Goswami

ABOUT CSIR-NISTADS

The roots of CSIR-National Institute of Science, Technology and Development Studies (CSIR-NISTADS) go back to August, 1973, when the Council of Scientific and Industrial Research (CSIR) set up at its headquarters a Centre for the Study of Science, Technology and Development. On September 30, 1980, the Governing Body of the CSIR approved that the Centre “should function as an autonomous Centre with a separate budget”. Its objectives “would continue to be the same”, but it “will be autonomous, headed by a scientist of the rank of a Director of a National Laboratory, with its own infrastructure”. September 30 is then the birth anniversary of the Institute (even though the present name came into effect on April 1, 1981).

CSIR-NISTADS is devoted to studying various aspects of interactions among science, society and the state, and is exploring continuously the interface between science, technology and society. It is one of the 38 institutes/laboratories under the Government of India’s Council of Scientific and Industrial Research (CSIR), New Delhi.

Currently, the faculty comprises 15 members drawn from a variety of academic disciplines. This intellectual diversity is the mainstay of the Institute. Research students from different universities enroll themselves in the Institute to obtain their PhD degrees. CSIR-NISTADS has a vibrant visiting scholars programme, under which researchers from India and abroad are encouraged to spend quality time at the Institute.



Vision:

To act both as a driver and a tool for ushering in socio-economic transformation at regional, national and global scales with policy and decision support, science and technology (S&T) design and translation.

Mission:

Creation of a techno-socio-economic platform to enable Sustainable Development Goals through development and application of acceptable, relevant, and commercializable S&T products through Policy Advocacy. Acting as a Think Tank, with Translational Research, Inclusion of Proof of Concepts and Integration of Outreach.

Mandate:

1. Provide Policy Advocacy on Techno-socio-economic issues identified by CSIR/Government.
2. Act as a Think Tank for Technology Foresight and S&T Design integrating socioeconomics to create enabling and applicable S&T and its inclusive penetration and provide periodic inputs.
3. Identify S&T needs for national missions and create road maps for Sustainable Development Goals.

Research Areas:

- S&T Application, Assessment and Planning(STAAP)
- Future Applicable S&T(FAST)
- Socio-Economics of S&T(SEST)
- Group Dynamics and Social Engineering(GDSE)
- Frontier Innovation and Research in S&T (FIRST)
- Climate Change, Adaption, Mitigation, Sustainability (CAMS)

The Institute has core competence in:

- ⇒ Science and Technology Policy Research
- ⇒ The concern and problems of developing countries

Among the diverse fields the Institute is involved in, some are:

- Water
- Rural areas
- S&T mapping
- High Technology
- Entrepreneurship
- Public Science and Technology

Our strengths:

- Interdisciplinary research teams
- Multi-discipline in faculty
- Long research experience
- Field research: designing/collecting primary data
- Students, visitors network partners Indian as well as international
- Access to CSIR resources, technologies, knowledge and people
- World-class IT facility
- World-class computerized library: access to several thousands of research journals and database

We have proven our capabilities in:

- Water resources, economics, management and life science.
- Entrepreneurship and Micro-entrepreneurship development
- Innovation-Strategy and management
- Intellectual property issues
- Knowledge management; R&D management
- Law, technology and economics
- Science policy
- Resource mapping/geography

RESEARCH PROJECTS

Summary of Research Projects

TITLE	TEAM	FUNDED BY	DATE OF COMPLETION
Indian S&T and Innovation Policy (ISTIP)	Dr. S. Bhattacharya; Dr. Tabassum Jamal; and Dr. Yogesh Suman	Council of Scientific and Industrial Research (CSIR HQ), New Delhi.	March 2017
Reduction of Atmospheric CO ₂ over Delhi Through Non-Disruptive and Sustainable Carbon Sequestration: System Design and Proof of Concept	Dr. P. Goswami (Nodal officer); Sandhya Wakdikar (PI) and Dr. Madhulika Bhati (Co-PI)	CSIR HQ, New Delhi	Ongoing
A Scientometric approach to study Arsenic, Fluoride, Nitrate and other heavy metals in drinking water during the 1995-2015 period: An outlook to treatment alternatives for removal of contamination	Dr. Madhulika Bhati (PI)	Department of Science and Technology, Govt. of India	Ongoing
Design of Policy Advocacy and Intervention for control of air pollution over Delhi through comprehensive quantitative analysis	Dr. P. Goswami (Nodal Officer), Dr. Naresh Kumar(PI), Dr. Madhulika Bhati (Co-PI), Avinash Kishitij and Dr. Praveen Sharma	CSIR HQ, New Delhi	March 31, 2017
Proactive Vector (Mosquito) Sanitation and Exposure Advisory for Prevention of Malaria, Dengue & Chikungunya in Delhi NCR Region	Dr. Suman Ray (PI), Avinash Kshitij and A.K. Bhardwaj	CSIR HQ, New Delhi	March 31, 2017
Assessment of Societal Problems in India	Dr. P. Goswami (Nodal Officer), Dr. Praveen Sharma (PI)	CSIR HQ, New Delhi	Ongoing
Opportunities of promoting Micro and Small Entrepreneurs (MSEs) in Northeast Region of India for income and employment generation	Dr. L. Pulamte and Dr. Mohd. Rais	CSIR HQ, New Delhi	March 31, 2017
Food Processing Industry in India: S&T capability and policy issues	Dr. Mohammad Rais	CSIR HQ, New Delhi	June 2016
CSIR Knowledge Gateway & Open Source Private Cloud Infrastructure (KNOWGATE)	Dr. Yogesh Suman	CSIR HQ, New Delhi.	March 31, 2017

RESEARCH PROJECTS

INDIAN S&T AND INNOVATION POLICY (ISTIP)

Coordinators: Dr. S. Bhattacharya; Dr. Tabassum Jamal; and Dr. Yogesh Suman

Duration: 2012-2017

Funded by: Council of Scientific and Industrial Research, New Delhi.

Date of completion: March 2017

Amongst several research projects undertaken at CSIR-NISTADS, the Indian S&T and Innovation Policy (ISTIP) was a major XII Five year plan project which investigate multiple facets of Indian STI and its contribution to the society.

The ISTIP research project intends to provide valuable inputs for S&T and Innovation decision making in the CSIR and the country, and evolve novel strategies that can contribute towards technology based interventions for addressing pressing problems. It also aims to provide evidence-based data & analytics to CSIR and other public institutions in policy planning and developing strategy for innovation. The project intends to address the critical knowledge gaps in the above mentioned domains by focusing on mapping of actors and agents in India involved in capacity in various techno-economic domains, outcomes of multiple forms of knowledge in India and in other relevant countries. The critical assessment of India's comparative strengths and gaps are undertaken within the larger context of capacities, and science and technology outputs and outcomes of advanced and emerging economies.

The core objectives of the project are as follows:

- Innovation policy directive for the government
- Analysis of MSME
Sector: Opportunities, policy gaps and action
- Quantitative measures of S&T innovation in India
- Generate innovation indices to judge India's innovation capabilities/progress across time, region, sector
- Analysis of India's manpower resources with respect to migration aspects of resources and comparative capabilities
- Generate technology sector reports on water, green technology, high technology and energy sectors.

Milestones achieved towards attainment of core objectives:

1. India S&T Report: Encompassing Issues Related to S&T and Human Resources; Innovation Support System; S&T and Industry, S&T Output and Patents and Rural Development and S&T Strategies. The following three reports have been published:

- India Science and Technology, Volume 1, published by CSIR-NISCAIR, New Delhi, 2010.
- India Science and Technology, Volume 2, published by Cambridge University Press India Pvt Ltd, New Delhi, officially released by President Pranab Mukherjee and Union Science and Technology Earth Sciences Minister Shri Jaipal Reddy on National Technology Day, 2013.

- India Science and Technology, Volume 3, published by Cambridge University Press, India Pvt Ltd, New Delhi, 2014.

2. Innovation Policy Bulletins:

- Understanding Innovation-The Indian Context
- FDI in R & D in India: Policy Implications
- Scientific Research in India: Drawing Insights from Bibliometric Indicators
- Dynamism in S&T and the Role of S&T and Innovation Policies in China
- Role of State S&T Council in the Indian Innovation System: Policy Perspective
- Nanotechnology Application in Water Sector.
- Promoting Innovation in Indian MSMEs: Indian Perspectives
- Affordable Health Care: Indian Perspectives
- India's Energy Profile Status and Challenges
- Water R&D in India, Trends and Interventions
- Food for Thought Policy Options for Indian Food Processing Industries
- Nanotechnology Research Innovation and Commercialization: An Indian Perspectives
- Knowledge Flow from Govt. R&D Institutions to Private Sector Industry and its Role in Value Addition.
- Industry Structure and the Pattern of Innovation: Basic Metal industry of India.
- Industry Structure and the Pattern of innovation: Chemicals Industry of India.
- Green Technology Revolution In Energy Sector
- India's Innovation Capacities and Capabilities
- Industry Structure and the Pattern of Innovation Pharmaceuticals Industry
- Performance of Indian Food Product Industries

4. Dissemination Workshops and Outreach Programmes:

- 'Innovating India: A two-day workshop', November 25-26, 2013, in collaboration with NIT, Silchar, Assam.
- 'Measuring Science-A Bibliometric Approach: A one-day workshop', February 14, 2014, CSIR-NISTADS, New Delhi.
- 'Innovation for Inclusive Growth and Entrepreneurship Generation', a one-day workshop jointly with the Punjab State Council in S&T and Punjab Innovation Council, July 23, 2014, Chandigarh.
- 'Innovation Landscape', November 25, 2014, CSIR-NISTADS, New Delhi.
- National Conference on 'Science, Technology and Innovation in Manufacturing', October 15, 2015, India International Centre (IIC), New Delhi.
- Conference on 'Opportunities and Challenges for Regional Innovation System (OCRIS)', at the IIC, New Delhi, October 6-7, 2016; and
- Analysis of MSME Sector: Opportunity, Policy Gaps and Action.
- Analysis of India's Manpower Resources with respect to Migration Aspect of Resources and Comparative Capabilities.

3. Sectoral Reports:

- Workshop on 'Indian Science & Technology Entrepreneurship Partnership (ISTEP)' jointly organised by the CSIR-NISTADS and the NIAS Bangalore at CSIR-NISTADS, New Delhi, on February 22-23, 2017.

Networking with industry – Academia linkages with IIT Roorkee, Roorkee (Uttarakhand), IIT Delhi, Aligarh Muslim University, Aligarh (UP), Cluster Innovation Centre (CIC), Delhi University, Delhi, Tata Energy Research Institute (TERI), New Delhi, National Institute of Advanced Studies (NIAS), Bangalore, NIT, Silchar, Assam, State S&T Councils of Uttar Pradesh, Lucknow and Punjab State S&T Council, Chandigarh.

REDUCTION OF ATMOSPHERIC CO₂ OVER DELHI THROUGH NON-DISRUPTIVE AND SUSTAINABLE CARBON SEQUESTRATION: SYSTEM DESIGN AND PROOF OF CONCEPT

Team: Dr. P Goswami (Nodal officer); Sandhya Wakdikar (PI) and Dr. Madhulika Bhati (Co-PI)

Funded by: Council of Scientific and Industrial Research, New Delhi.

Date of Start: March 2016

Status: Ongoing

The annual CO₂ emission over Delhi is nearly 15 million tonnes (with about 5-6% annual increase) and a major source of poor air quality and contribution to global warming. CSIR NISTADS has been exploring techno-policy options that would provide implementable and sustainable solution to address the problem. Based on earlier studies at CSIR and other background studies, CSIR NISTADS had

taken up a Translational Project to develop a Proof-of-Concept to stabilize, and if possible reduce, atmospheric carbon as a part of its applied policy research.

Under the project, optimal growth conditions under representative urban (Delhi) soil conditions have been used under open environment. Implement ability is established by developing and maintaining field plots through inter-institutional arrangements among the CSIR-NISTADS, CSIR-NPL and CSIR-IGIB, functional for the past about one year. In terms of effectiveness, measurements show that the percentage of carbon sequestered in the field plots in Delhi is comparable to that in the farm environment in Bangalore.

A report based on the initial carbon measurements has been prepared with a specific policy advocacy and sent to reviewers for their critical review and recommendations.

A SCIENTOMETRIC APPROACH TO STUDY ARSENIC, FLUORIDE, NITRATE AND OTHER HEAVY METALS IN DRINKING WATER DURING THE 1995-2015 PERIOD: AN OUTLOOK TO TREATMENT ALTERNATIVES FOR REMOVAL OF CONTAMINATION

Team: Dr. Madhulika Bhati (PI)

Sponsor: Department of Science and Technology, Govt. of India

Date of Start: March 23, 2016

Status: Ongoing

The aim of this research is to offer a global structure of the removal of various contaminants from drinking water.

Bibliometric analysis provides a comprehensive analysis to technical solution for removal of under-study contaminants and worldwide available technologies, which can serve for the bottom of pyramid society. The analysis can offer a summary of the overall structure of the target research domain and emerging research topics. Our results can offer an intellectual basis for constructing a roadmap of technology solutions for removal of various contaminants from drinking water. This research will allow us to map different technologies available for removal of contamination from water worldwide. Besides this, it will also be able to find prolific institutions as well as researchers and policymakers in different countries, which can further useful to find potential international as well as national partners for future projects.

The objective of the current analysis is to identify the trend of research since the year 1995 to 2015 on removal of contaminants from water with the aim to:

- Understand the knowledge structure both quantitatively and visually by integrating keyword analysis and social network analysis of scientific papers;
- Comprehensive study of the technologies available worldwide for removal of these contaminants from drinking water altogether;
- Catalogue the international and national collaboration of countries undertaken for study and identify linkage of research interests;
- Study the authorship pattern, degree of collaboration, highly productive authors in the field of study; and

- Identify the important stakeholders in public and private sector.

DESIGN OF POLICY ADVOCACY AND INTERVENTION FOR CONTROL OF AIR POLLUTION OVER DELHI THROUGH COMPREHENSIVE QUANTITATIVE ANALYSIS

Team: Dr. P. Goswami (Nodal Officer), Dr. Naresh Kumar (PI), Dr. Madhulika Bhati (Co-PI), Avinash Kishitij and Dr. Praveen Sharma,

Funded by: Council of Scientific and Industrial Research, New Delhi.

Date of start: June 2016

Date of completion: March 31, 2017

Air pollution depends on surface sources like emission and natural processes like advection. Air pollution at a location is thus affected by several local and remote factors. For precision and effective air pollution system it is necessary to use collocated pollution, traffic and meteorological variables like wind speed and wind direction. In addition, the sampling should be at sufficiently high temporal frequency. However, such collocated and precise data on various sources of pollution is lacking. While agencies like the Central Pollution Control Board (CPCB) and the Ministry of Earth Sciences (MoES) regularly monitor various aspects of air pollution, there is a critical gap in data and our understanding of air pollution for effective policy intervention. Therefore, the project aimed at developing an implementable, effective and sustainable policy intervention based on adequate data.

PROACTIVE VECTOR (MOSQUITO) SANITATION AND EXPOSURE ADVISORY FOR PREVENTION OF MALARIA, DENGUE & CHIKUNGUNYA IN DELHI NCR REGION

Team: Dr. Suman Ray (PI), Avinash Kshitij and A.K. Bhardwaj

Funded by: Council of Scientific and Industrial Research, New Delhi.

Date of start: November 10, 2016

Date of completion: March 31, 2017

Outbreaks of malaria, dengue and chikungunya depend on abundance of mosquito vector, exposure of the [incidental] human host to mosquito bites and rate of transmission. However, abundance of vectors can be said to determine the dynamics of the epidemic. Identification of the peaks in vector population, which would precede the disease outbreak by a typical incubation time of the parasite in the human host, can, therefore, enable proactive control of malaria. In particular, vector controls are effective for mitigation only if they are carried out at the time of maximum exposure rather than at the time of detection of infection. The proposed project aims at creating and field-testing such a Vector Outbreak Prediction System (VOPS).

ASSESSMENT OF SOCIETAL PROBLEMS IN INDIA

Team: Dr. P. Goswami (Nodal Officer), Dr. Praveen Sharma (PI)

Funded by: Council of Scientific and Industrial Research, New Delhi.

Date of start: February 27, 2017

Status: Ongoing

This project was initiated to gather data and facts on the foremost problems and sub-problems confronted by the people of India. The objective is to build capability for S&T solution approach. The tactic taken in identification of problems has been largely people-centric. The main objective would be to attain people-centric R&D design. Even the sub-areas of problems defined under each sector need to be rather broad and would need further emphasis for design of implementable solutions; such identification and prioritization needs to be based on careful socio-techno-economic evaluation at required spatial resolutions.

OPPORTUNITIES OF PROMOTING MICRO AND SMALL ENTREPRENEURS (MSEs) IN NORTHEAST REGION OF INDIA FOR INCOME AND EMPLOYMENT GENERATION

Team: Dr. L. Pulamte and Dr. Mohd. Rais

Funded by: Council of Scientific and Industrial Research, New Delhi.

Duration: October 2016

Date of completion: March 31, 2017

Rightly known as the engine of economic growth, the Micro, Small and Medium Enterprises (MSMEs) play a very important role in a country like India, where millions are unemployed and underemployed with resultant problems of poverty. The MSMEs, despite requiring low investments, provide large-scale employment and occupy the position of the second largest manpower employer after agriculture in India, and thus proved its prominence in Indian economy. The importance of MSMEs is all the more significant for the Northeast Region of India where large-scale industries are yet to fully establish their presence due to certain inherent

constraints of the region. Moreover, it is relatively easier to promote and develop MSMEs in the region due to several factors like inherent advantages of MSMEs such as flexibility, inexpensive labour and less overheads, owner management and favourable capital-output ratio, diverse natural and cultural settings of the region, low skill profile of the people, state and central governments' support, etc.

The Northeast Region of India comprises eight states, namely Manipur, Mizoram, Nagaland, Tripura, Meghalaya, Assam, Arunachal Pradesh and Sikkim. It has diverse climatic, geographical, topographical and cultural endowments. The region is isolated in terms of not only geographical location but also technologically and industrially. It has common borders with China, Nepal, Bhutan, Myanmar and Bangladesh and hence occupies a strategic position in terms of national security and international trade. Therefore, socio-economic developmental works for enhanced inclusion and improved equity should receive top priority for this region.

The industrialization process is at a slow pace. However, there is a sizable number of industrial enterprises: 33,456 Micro, 803 Small and 36 Medium enterprises accounting for 2.25%, 1.04% and 1.34 % respectively of India's total number of industrial enterprises. These types of enterprises in the region employ 2,07,883, 88,405 and 18,929 persons, respectively. Of these enterprises, 25,021 are involved in manufacturing/assembly/processing, 5,029 in services and 4,245 in repairing and maintenance.

This project was initiated with the following objectives:

- To build techno-socio-economic profile of the NE region.
- To assess the state of development of the MSEs in the region in terms of investment, employment generation, contribution to economic growth and production, and identification of their problems and strengths;
- To strengthen the existing MSEs through S&T interventions and viable business models;
- To explore the potentials of establishing and promoting new types of MSEs keeping in view the natural and cultural endowments of the region.

FOOD PROCESSING INDUSTRY IN INDIA: S&T CAPABILITY AND POLICY ISSUES

Team: Dr. Mohammad Rais

Funded by: Council of Scientific and Industrial Research, New Delhi.

Date of Start: July 2014

Date of completion: June 2016

Meat Processing in India: Science, Technology Policy and Skill Development Issues

In 2015, India retained its top position as the world's largest exporter of buffalo meat. India does not officially export cow meat. However, the Indian buffalo meat is witnessing a strong demand internationally due to its organic nature and lean character. Also, India has a cost advantage as the Indian buffalo meat is one of the most competitively priced red meat in the world. Some of the challenges faced by the meat industry are lack of scientific approach to rearing of such animals, lack of good and

nutritious fodder resulting in low-quality meat and the unorganized nature of meat production and marketing. Poor post-slaughter management and primitive slaughtering facilities, using unsanitary practices and lacking basic facilities, hamper the growth of this sector. Therefore, the next phase of active reforms in the buffalo meat industry for the domestic market should consider modernization of existing abattoirs, strengthening of the livestock market, utilization of by-products, an efficient disease diagnostic and monitoring system, amendments to the Meat Export Policy and developing a state-wise market intelligence system for the livestock sector, which can assist in realistic planning at all levels. Robust Science and Technology (S&T) policy and skilled manpower for the sector would also provide a boost to the sector. Demand for processed meat and poultry is

expected to be driven by increasing consumption levels. Demand for high-value frozen foods and preference for fresh meat in the domestic market will drive growth in the export markets. Global dietary habits are rapidly changing and India, with one of the world's largest livestock population, is also gearing up for the increase in demand. Also, with the advent of big players, their state of art processing infrastructure and increased capacity will help to fulfil the demand. With a compounded annual growth rate (CAGR) of 16.3%, the meat processing sector is estimated to grow from 369 billion in 2008 to 3000 billion in 2022.

Publications: M. Rais, and S. Sherin K. (2016) 'Meat Processing in India: Science, Technology Policy and Skill Development Issues', *Journal of Meat Science and Technology*, 4(2): 53-61.

CSIR NETWORK PROJECT

CSIR KNOWLEDGE GATEWAY & OPEN SOURCE PRIVATE CLOUD INFRASTRUCTURE (KNOWGATE)

Nodal officer: Dr. Yogesh Suman

Funded by: Council of Scientific and Industrial Research, New Delhi.

CSIR Networking project coordinated by CSIR- NISCAIR

Date of start: February 2013

Date of completion: March 31, 2017

CSIR Knowledge Gateway & Open Source Private Cloud Infrastructure (KNOWGATE) is a 12th Five Year Plan (FYP) Network Project under Information Sciences cluster. The project ran through 2012-2017 (March) and was implemented in a network mode by CSIR-NISCAIR as the nodal laboratory with 38 CSIR laboratories as participating laboratories, including CSIR-M Complex and the CSIR-HQ. It was implemented in a phased manner by dividing 39 CSIR KRCs

(Knowledge Resource Centres) into four groups.

The objective of the project was to enhance the capacity and capability of CSIR computing power through CSIR private cloud infrastructure and Open Source Software Technology Solution Cell (OSSTSC), and to provide CSIR KRCs an Integrated Library Management Solution using open source software besides sharing information resources among CSIR laboratories by creating CSIR Distributed Library: catalogue sharing, inter-library loans, & referral service for document supply service. The project has been able to achieve most of its objectives. NISTADS benefited in various ways through this project; so far, most of the collections in the institute's library have been computerized and made searchable on the internet. Apart from this, the acquisition and issue of books in the library have also been computerized.

ACADEMY OF SCIENTIFIC AND INNOVATIVE RESEARCH (AcSIR)

ACADEMY OF SCIENTIFIC AND INNOVATIVE RESEARCH (AcSIR)

Coordinator: Dr. Yogesh Suman

CSIR-NISTADS, as a part of the Academy of Scientific and Innovative Research (AcSIR), has introduced PhD programmes on Science, Technology and Innovation Studies (STIS). The purpose of the courses is to create a critical mass of scholars and practitioners with analytical competencies to lead and transform India's science, technology and innovation trajectories in economically productive, socially progressive and environmentally sustainable ways. In its academic and policy endeavours, CSIR-NISTADS operates as the interface between science and society. At present, there are 15 PhD students at the institute pursuing their degrees through AcSIR. The courses being offered at AcSIR-NISTADS include:

1. Quantitative Research Methodology
2. Introduction to Qualitative Research
3. Indian Economy & Policy
4. Innovation Systems & Development
5. Science and Technology Systems – India and the World
6. Science, Technology & Innovation Policy
7. Trade & Technology
8. Enterprise Development through Value Chains Analysis
9. Intellectual Property Rights in the Context of Research, Innovation & Development
10. Resource Planning & Policy
11. Principle of Economics
12. Science, Technology & Innovation Strategy
13. An Introduction to Probability and Statistics
14. Introduction to History of Science

Students are pursuing their PhDs in various areas of research like:

- Decision support system and big data analytics
- Water and sanitation for public health
- Role of bilateral institutions in developing knowledge, networks and research innovation ecosystem
- Food and Nutrition Policy and regulatory framework
- S&T Policy conversions and analysis of livestock, breeding, engineering and biodiversity in India
- Interoperability of e-health applications
- Natural resources management
- Intellectual Property Rights
- Knowledge-based collaboration between Govt. research institutions and private sector industry
- Policy studies in genetic engineering
- Policies for MSME in agro-based sector and rural development
- Vaccines and public health sciences
- Api-culture in the Northeast Region

KNOWLEDGE PROFILE

- **PUBLICATIONS**
- **LECTURES/CONFERENCE PRESENTATIONS**
- **STAFF NEWS**
- **CONFERENCES**
- **LECTURES**
- **OUTREACH PROGRAMME**
- **CSIR-NISTADS IN NEWS**



Summary

- Papers published in SCI Journals = 6
- Research reports = 3
- Papers published in conference proceedings = 2
- Lectures delivered and presentation in conferences = 8
- Staff visits abroad on deputation = 4
- Workshops, Conferences, meetings and other events organized = 9

PUBLICATIONS

JOURNAL PAPERS

1. K.C. Garg and S. Kumar (2016) - 'Scientometric Profile of an Indian State: The Case Study of Odisha', *Collnet Journal of Scientometrics and Information Management*, 10(1): 141-153.
2. K.C. Garg and S. Kumar (2016) - 'Bibliometrics of Global Ebola Virus Disease Research as seen through Science Citation Index Expanded during 1987-2015', *Travel Medicine and Infectious Disease*, online October 20, 2016, <http://dx.doi.org/10.1016/j.tmaid.2016.09.013> 2016.
3. M. Manisha (2016) - 'Sustainable Sanitation for India', *Journal of Public Health Policy*, 37(1): 121-122.
4. M. Rais, and S. Sherin K.(2016) - 'Meat Processing in India: Science, Technology Policy and Skill Development Issues', *Journal of Meat Science and Technology*, 4(2): 53-61.
5. Naresh Kumar (2016) - 'Impact of Parental Socio-Economic Factors on the Performance of Students in IIT-JEE', *Current Science*, 110(11): 2079-2081.
6. Renu Jethi (2016) - 'Major Air Pollutants and Their Effect on Health', *Journal of Energy Research and Environmental Technology (JERET)*, 3(4): 228-234.
7. Renu Jethi (2016) - 'Mapping of STS Literature in Current Literature on Science of Science (CLOSS) of Special Issues on Developing Countries', *Advances in Computer Science and Information Technology (ACSIT)*, 3(6): 527-534.
8. Renu Jethi (2017) - 'Mapping of STS Literature in the form of Books and Reports as covered in various issues of the Journal Current Literature on Science of Science (CLOSS)', *Journal of Basic and Applied Engineering Research*, 4(1): 36-39.
9. Renu Jethi (2017) - 'Mapping of STS Literature on Science and Technology Studies in India', *Advances in Computer Science and Information Technology (ACSIT)*, 4(1): 20-24.
10. S. Bhattacharya, Shilpa (2016) - 'Capturing the Growth Dynamics of Science: A Publication-Based', *Current Science*, 110(8): 1419-1425.
11. Shailaja Rego, Naresh Kumar and P. N. Mukherjee (2016) - 'Impact of Policy Implementation on Telecommunication Diffusion in India', *International Journal of Process Management and Benchmarking*, (in press).
12. Suman Ray (2016) - 'Utilization Pattern of Anti Dementia Drugs and Cost-Effective Analysis: Indian Scenario', *Advances in Pharmacology and Clinical Trials*, 1(2):000109.
13. V. Rakesh and P. Goswami (2016) - 'An Evaluation Strategy of Skill of High-Resolution Rainfall Forecast for Specific Agricultural Applications', *Meteorological Applications*, 23(3): 529-540

EDITED POLICY BOOK

- Prashant Goswami and Baldev Raj (eds.) (2016) - 'BRICS Science &

Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations', First Edition: September 2016.

RESEARCH REPORTS

1. Prashant Goswami and Shivnarayan Nishad (2016) - Report on 'Agricultural Trade with Virtual Water Trade Balance: A Policy Framework for Sustainable Agricultural Export', School of Environment, Ecology and Sustainable Development (EESD), NISTADS, April 2016.
2. Prashant Goswami, Kasturi Mandal and S. Garg (2016) - 'CSIR: 75 Years of Touching Lives: A Survey of People's Perception', report of analysis based on survey conducted during CSIR Platinum Jubilee Technofest 2016 at IITF, Pragati Maidan.
3. Sujit Bhattacharya, Azamat Ali, and Shilpa (2016) - 'Nanotechnology Research and Innovation for Development: Status and Prospects in India', prepared by CSIR-NISTADS, New Delhi, December

PAPERS PUBLISHED IN CONFERENCE PROCEEDINGS

1. Anurag Kanaujia, Sujit Bhattacharya (2016) - 'Regulation, Innovation and Governance: A case study of GM crops in India', 1st International Agrobiodiversity Congress, on November 6-9, 2016, published in the abstract book 1312 (p-417) pp. 284.
2. Kashmiri Lal (2016) - Abstract of 'Internationalization of Indian Multinational Corporations: A Case Study of Bharat Forge and Essel Propack', in Proceedings of

International Conference on Developments in Management, Technology and Business (ICDMTB 2016) (eds. Sapna Rakesh, Anita Mathew and V.N. Bajpai), organised by the Institute of Technology & Science, Mohan Nagar, Ghaziabad, April 1-2, 2016, pp.133, Bloomsbury: New Delhi.

PAPERS IN EDITED POLICY BOOKS

1. P. Goswami and Baldev Raj (2016) - 'Prologue: BRICS and World Order', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.9-10.
2. S. Relia, A. Kumar, K. Mandal and S. Chandran (2016) - 'BRICS: Emerging Reality', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.11-12.
3. P. Goswami and Baldev Raj (2016) - 'BRICS: Common Aspirations, Common Challenges', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.13-14.
4. K. Mandal and P. Goswami (2016) - 'BRICS-STEP: Characterization and Structure', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise*

- Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.17-18.
5. S.P. Bhuvaneshwaran, S. Bhattacharya, T. Jamal, S. Pohit, K. Mandal and P. Goswami (2016) - 'BRICS-STEP: An Operational Model', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.19-20..
 6. S. Pohit, K. Mandal and P. Goswami (2016) - 'BRICS-STEP: Strategy and Positioning', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.21-22.
 7. N. Agrawal, S. Saikia, J.Chintalapati, S. Mohanty and Y. Suman (2016) - 'Computational Intelligence', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, page no.24.
 8. M. Bhati, S. Arunachalam, A. Dhar, S.P. Bhuvaneshwaran, K. Biswas, S. Pohit, Nagaraja Bhat Y.V. and Sujoy K. Guha (2016) 'Energy', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, page no.25.
 9. S. Anand, N. Tarannum, S. Ray and A. Vaid (2016) 'Healthcare', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.), *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'* First Edition: September 2016, page no.26.
 10. S. Bhattacharya, S. Pohit and P. Goswami (2016) - 'BRICS-STEP: IPR Policy and Financial System', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.27-28.
 11. N. Kumar, S. Bhattacharya, T.A. Abhinandan, S. Arunachalam, M. Bhati and A.K. Das (2016) - 'BRICS-STEP: Building on Experience and Competencies', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.29-30.
 12. K. Mandal and P. Goswami (2016) - 'Second-moment (h-index) Analysis', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.31-32.

Transformations', First Edition:
September 2016, page no.31.

13. P. Goswami and Baldev Raj (2016) - 'Epilogue/Outlook', in Dr. Prashant Goswami and Prof. Baldev Raj (eds.) *'BRICS Science & Technology Enterprise Partnership: Bold, Responsive, Inclusive and Cohesive Solutions for Rapid Transformations'*, First Edition: September 2016, pp.33.

PAPER ACCEPTED IN JOURNALS

- Shilpa, Bhattacharya, S. (2017) - Indo-French Cooperation in Water Sciences: Capturing Research Dynamics through Co-Authorship Analysis. *Current Science*.

MISCELLANEOUS

- Bhattacharya, S. and Lal, K. (2016) - 'Industrial R&D in India: Contemporary Scenario Part-2', *Mantra Textile Magazine*, 10(8): 5-12.
- Madhulika Bhati (2016) - 'Renewable Energy technologies landscape: A patent analysis of BRICS Nations', *Energy Manager* (a quarterly magazine of the society of energy engineers and

managers, 9(04): 30-35. ISSN 0974-0996.

EDITOR-IN-CHIEF

- **Dr. Sujit Bhattacharya** is Editor-in-Chief of *Journal of Scientometric Research* (*J. Scientometric Res.*), which is an internationally targeted official publication of Phcog.Net. It publishes peer reviewed articles online in an open access format. The journal encourages both empirical and theoretical contributions that advance scientometric research and also reaches out to scholars of Science and Technology Studies (STS), sociology, economics and any other field, who use scientometric data as the 'object of investigation' or apply scientometric analysis in policy or innovation studies. The journal thus seeks to publish articles in all the different domains of scientometrics, including patent studies (techometrics) and web-based studies (webometrics). [ISSN: Print - 2321-6654, Online - 2320-0059].

Frequency: Rapid at a time publication
- Triennial (3 issues/year)

LECTURES/CONFERENCE PRESENTATIONS

1. Bharvi Dutt, A. Bhardwaj, Suresh Kumar: 'R&D Efforts in India in Dye-Sensitized Solar Cell: A Scientometric Study', at the 12th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 17th COLLNET Meeting, 2016, December 12-15, 2016, Nancy, France.
2. K.C. Garg and Suresh Kumar: 'A Quantitative Analysis of the Knowledge Generated by AMU scholars using Scientometric Techniques', at the International Conference on Knowledge Generation, Discovery and Networking', held at Aligarh Muslim University, February 15-16, 2017.
3. Kashmiri Lal: 'Internationalization of Indian Multinational Corporations: A Case Study of Bharat Forge and Essel Propack', in the International Conference on Developments in Management, Technology and Business, at the Institute of Technology & Science, Mohan Nagar, Ghaziabad, April 1-2, 2016.
4. Madhulika Bhati and Radhika: 'Emerging Technology Interventions to Solve Water Contamination Related Problems: An Indian Case study', at the National Conference on Environmental Pollution: Consequences and Control, IIS Campus, Jaipur, October 7-8, 2016.
5. Madhulika Bhati and Radhika: 'Technology Intervention for Water Purification by CSIR and Other Stakeholders: An Overview', at the International Conference on Water: From Pollution to Purification, organised by Mahatma Gandhi University, Kerala, December 12-15, 2016.
6. Madhulika Bhati delivered an invited talk on 'Renewable energy and BRICS Countries' S&T Intervention', in the Second International Conference on Advanced Materials for Power Engineering Mahatma Gandhi University, Kerala, November 11-13, 2016.
7. Madhulika Bhati, Rehan Ahmed and Radhika: 'A Solar Energy landscape in India.: Policy Environment, Challenges and Opportunities', at the 4th Triennial International Workshop on Evolving Energy Models in Emerging Economies-Post COP21, Ahmedabad, Gujarat, December 12-14, 2016
8. P. Goswami delivered a talk in a brainstorming session on 'India Science & Technology: Perspective Views', at NITI Aayog, December 5, 2016.

OTHER INFORMATION

1. Rammi Kapoor and Kashmiri Lal attended a Training Workshop on RTI Online Portal for Nodal Officer, on November 10, 2016 at the CSIR-Human Resource Development Centre, Ghaziabad.
2. The Best Paper Award was given to Kashmiri Lal at the International Conference on 'Developments in Management, Technology and Business', held at the ITS Ghaziabad, during April 1-2, 2016.

STAFF NEWS

S.No.	Name & Designation	About the Visit	Duration of visit
1.	Dr. (Mrs.) Rajeswari S. Raina, Principal Scientist	Visited USA to participate in the conference on Transforming the Economy: Sustaining Food, Water, Energy and Justice organized by the International Society for Ecological Economics (ISEE).	June 26-29, 2016
2.	Dr. Vipin Kumar, Principal Scientist	Visited Humboldt University, Berlin to participate in the conference on “International Cooperation for Sustainable Development” Programme – Green Cities for Sustainable Development in the Urban Century	October 3-14, 2016
3.	Dr. Kasturi Mandal Scientist	Visited South Korea to facilitate collaboration between KISTEP & CSIR-NISTADS and to attend the 2 nd Asian Innovation Forum (AIF) and collaboration between STEPI and CSIR-NISTADS.	August 27 to September 2, 2016
4.	Dr. P. Goswami Director	Visited South Korea: (i) To meet with the President, Korea Institute of S&T Evaluation and Planning (KISTEP), South Korea for discussion on MoU between KISTEP and CSIR-NISTADS, (ii) To attend the 2 nd Asian Innovation Forum (AIF), and (iii) To facilitate future collaboration between STEPI and CSIR-NISTADS	August 27 to September 2, 2016

WORKSHOPS, CONFERENCES AND OTHER EVENTS

WORKSHOPS, CONFERENCES AND OTHER EVENTS

CELEBRATION OF INTERNATIONAL DAY OF YOGA

Yoga can have invaluable effects on our body, mind, behaviour, thoughts and vision. Yoga is not merely a physical exercise, but an art of science for healthy living. By practising yoga correctly, we can develop a positive attitude, love and compassion for humanity, and, above all, lead a healthy and purposeful life.

All these wonderful effects of yoga were discussed and practised on June 21, 2016, during the International Day of Yoga at CSIR-NISTADS. About 40 participants took part in the yoga session.



On the gracious occasion Dr. Sujit Bhattacharya, Sr. Pr. Scientist expressed his views, along with Sh. Kashmiri Lal, Sr. Technical Officer and Coordinator



Participants performing Yogic Kriyas

Following aasanas and pranayama were practised during the session:

- Suksham Kriyas: neck; trunk; knee; arms, wrist; fingers and shoulder movements.
- Aasanas: Ardh Chandra Aasana; Vajra Aasana; Shanshank Aasana; Yog Mudra, Sinh Aasana, and Hansi (Laughing).
- Dhyana and Shubh Sanklap.
- Shanti Patha.

CELEBRATION OF CSIR FOUNDATION DAY

Children of CSIR-NISTADS staff participated in various activities on the occasion of the CSIR Foundation Day, celebrated at the institute on October 5, 2016. The main activities for children during the Foundation Day celebration included drawing and essay competitions held at the institute. Cultural and stage activities also were organized for the staff and their children to mark the occasion.



Dr. Satpal Sangwan, former Scientist at the CSIR-NISTADS was invited as the chief guest. Prizes were distributed by the chief guest, the Director and the distinguished

scientists present on the occasion to appreciate the performances of the participating children during the function.



WORKSHOP/EXPERT PANEL DISCUSSION

A national workshop and expert panel discussion on the Social Dynamics Prediction System (SDPS) was organized by CSIR-NISTADS on September 30, 2016, to examine the desirability and the feasibility of such a system and formulate a roadmap. The participants included scientists from different institutions and NISTADS, in addition to the NISTADS Director and AcSIR PhD scholars. The inaugural address was delivered by Dr. Ashok Jain, formerly Director, CSIR-NISTADS and Fellow, National Academy of Sciences.



Dr. Ashok Jain, Ex-Director, NISTADS is lighting the lamp



Participants during keynote address

It was recommended in the meeting that a comprehensive national programme on the Social System Modelling and Prediction should be developed by identifying and integrating the important components. The programme, it was suggested, should be on a national network mode to ensure the required multi-disciplinary expertise and critical mass.



(From L-R): Dr. Ashok Jain and Dr. P. Goswami releasing the CSIR-NISTADS Annual Report 2015-16



(From L-R): Dr. P. Goswami, Dr. Ashok Jain, Mrs. Mercy Joseph, Dr. N. Mrinalini and Dr. G.D. Sandhya (lighting the lamp)

NATIONAL WORKSHOP



Dr. P. Goswami is presenting a bouquet to Prof. Ashok Chandra

A national workshop on ‘Opportunities and Challenges for Regional Innovation System (OCRIS)’ was held at the India International Centre, Lodhi Estate, New Delhi on October 6-7, 2016. The workshop aimed to provide valuable insights for policy makers and scholars to underscore the interventions that can strengthen the Regional Innovation System with the objectives like initiating regional dialogue on innovation; analysis of regional innovation needs and capacities; selection of priorities for innovation support and the implementation of the strategy.



Participants at the workshop

The two-day workshop was divided into eight sessions. It was inaugurated with the welcome and opening remarks by Dr. P. Goswami, Director, CSIR-NISTADS, followed by the speeches delivered by the guest of honour, Dr. D.K. Aswal, Director, CSIR-NPL and the chief guest at the

workshop Prof. Ashoka Chandra, former Secretary, MHRD, Govt. of India; and Chairman RC, CSIR-NISTADS. Introduction about the workshop was given by Dr. Tabassum Jamal, Chief Scientist, CSIR-NISTADS. The key-note address was delivered by Prof. M.H. Bala Subrahmanya, Professor of Economics at the Department of Management Studies, Indian Institute of Science (IISc), Bangalore.



Dr. P. Goswami is presenting bouquet to Prof. M.N. Bala Subrahmanya

Sessions held on the following themes:

- ⇒ Innovation System - A National Perspective Indian Regional Innovation System
- ⇒ Regional Innovation System: International Perspective
- ⇒ CSIR Impact in Promoting Regional Innovation System
- ⇒ Regional Innovation System- Case Studies
- ⇒ Pressing Problems of India and imperative for S&T Intervention



Talk by Dr. Ashok Jain, Ex-Director, NISTADS



Ambassador A.R. Ghanshyam (left), Dr. Tabassum Jamal (center), Chief Scientist presenting a memento to Dr. Shrini V. Kaveri (extreme right), Director CNRS Office in India, Embassy of France, New Delhi

The workshop was attended by eminent participants like: Prof. K. J. Joseph, Centre for Development Studies, Ministry of Commerce Chair, Trivandrum, Kerala; Dr. Tamal Sarkar, Director, Foundation of MSME Cluster; Dr. Shrini V. Kaveri, Director, CNRS Office in India, Embassy

of France, New Delhi; Dr. H. Purushotham, Chairman & Managing Director, NRDC, New Delhi; Dr. Satish Chandra, Director CSIR-CRRI, New Delhi; Dr. Anil K. Tripathi, Director CSIR-CIMAP, Lucknow; Dr. Sanjay Kumar, Director CSIR-IHBT, Palampur; Prof. V. Sivalingam, Director, NIFT-Bengaluru; Prof. K. Elumalai, Director, School of Law, IGNOU, New Delhi; Dr. Ashok Jain, former Director, NISTADS, Fellow, National Academy of Sciences; etc.

The last session comprised a panel discussion and policy recommendations, followed by the concluding remarks and the vote of thanks by Dr. Sujit Bhattacharya, Senior Principal Scientist, CSIR-NISTADS.

CSIR PLATINUM JUBILEE



(From L-R): Dr. Mohd. Rais, Sr. Pr. Scientist; Dr. P. Goswami, Director; Dr. Kasturi Mandal, Scientist and Dr. Tabassum Jamal, Chief Scientist of CSIR-NISTADS during inauguration of CSIR Platinum Jubilee Celebration

With its entry into the 75th year of touching lives in India, CSIR planned an event to assess its presence and performance through the eyes of its extreme end clients - the people. CSIR planned this event strategically alongside the 36th India International Trade Fair (IITF) at Pragati Maidan, New Delhi, from November 14-27, 2016. The event was inaugurated by the Minister of Science and Technology and Earth Sciences, Dr Harsh Vardhan.

During the 12 days of the event, people from all walks of life were invited and received at the CSIR pavilion. The visitors were exposed to a wide spectrum of CSIR technologies and products that have touched lives of people in India in the past 75 years. Selected contributions from the CSIR labs were organized under life-touching themes like water, food and

environment; dedicated scientists interacted with the visitors throughout the event, aided by carefully prepared audio-visuals and working models of technology products.

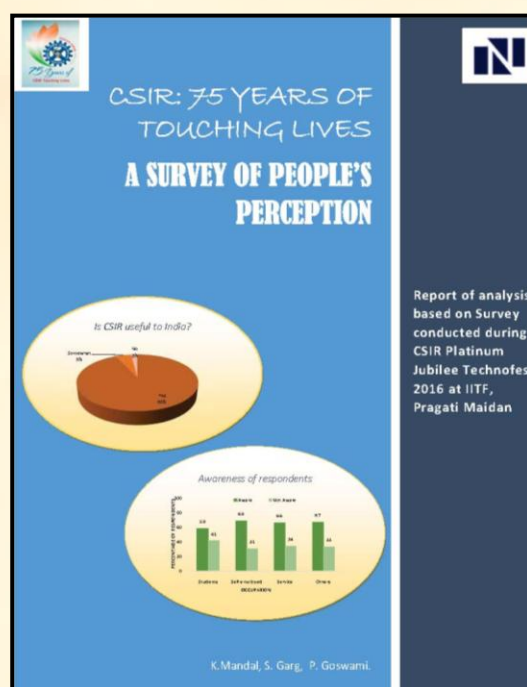
A feedback survey of the CSIR Mega Expo was conducted by CSIR-NISTADS. It was based on a carefully prepared questionnaire to record, assess and analyse visitors' feedback on the performance of the CSIR through direct questions like "Are you aware of CSIR" and "Is CSIR useful to India". The visitors were also requested to provide general comments and recommendations. Overall, the event was found to have a very high impact. The responses were revealing. A CSIR-NISTADS report has recorded those responses and their implications.



CSIR-NISTADS staff conducting the primary survey at IITF-2016

In terms of people's perception, 97% of the respondents opined CSIR to be useful to India, while 2% felt it was of some usefulness. In terms of impact, the event was found to have significantly enhanced the awareness level of all categories of visitors about the CSIR. The CSIR pavillion was awarded the Gold Medal by the India International Trade Association for its high quality. The main exhibition was supplemented by various business sessions, training sessions and interactive sessions for students. Comments and suggestions were received both at survey points and also at the theme stalls.

A number of recommendations have been made based on the analyses; an important recommendation is that such events need to be organized more frequently for focused groups of audience and in different parts of the country.



A report titled '**CSIR 75 Years of Touching Lives: A Survey of People's Perceptions**' has been brought out based on the survey.

India International Science Festival Open Day

CSIR-NISTADS OUTREACH PROGRAMME WITH SCHOOL CHILDREN



Participants at the IISF Open Day programme

An outreach programme for the schoolchildren was organised by CSIR-NISTADS on November 17, 2016. During the programme, various activities were held, including debates on the topic 'Institutional schooling should be abolished'; and showcase of CSIR NISTADS research through poster presentation.



Scientists from CSIR-NISTADS and school children actively participated in the Q/A session

Senior Principal Scientist, on technologies for the future. Besides, an interactive session between schoolchildren and scientists on various career aspects was also held.



Scientists from CSIR-NISTADS addressing the school children during the programme

A lecture was delivered by Dr. Tabassum Jamal, Chief Scientist, and Dr. Md Rais,



School children during one of the activities of the programme

WORKSHOP

A workshop on the Indian Science & Technology Entrepreneurship Partnership (ISTEP) was jointly organised by CSIR-NISTADS and NIAS Bangalore at CSIR-NISTADS, New Delhi, on February 22-23, 2017. The primary goal of the workshop



Dr. Girish Sahni (right), Director General, CSIR and Secretary DSIR is addressing the participants.

was to identify enterprise goals based on compelling necessities that can significantly value-add national aspirations and provide global leadership. The meeting examined and explored major thematic areas to make a successful ISTEP. It was discussed that realization of the ISTEP will require sustained, significant and synergetic efforts systematically involving thought leaders, established researchers and young researchers. Accordingly, the meeting included all the three tiers from industry and academia to develop strategies and roadmap for ISTEP.



Dr. P. Goswami (left) welcoming Dr. Baldev Raj, Director, National Institute of Advanced Studies, Bengaluru and Chief Guest of the workshop

The sessions highlighted thematic areas and brought out critical issues. Groups of participants discussed each thematic area in detail to develop working models. They also synthesized the inputs to arrive at an integrated ISTEP plan. The panel discussion proposed a comprehensive set of recommendations.



Participants at the workshop

MEETINGS

1. A daylong meeting on consultation on **‘Strategies for Managing Droughts-Need for Aligning Science and Public Policy’**, organised by CSIR-NISTADS; SPWD; Delhi Science Forum; and Revitalising Rainfed Agriculture (RRA) Network, held at CSIR-NISTADS, on June 3, 2016.

2. A national meeting for preparing a document on **‘BRICS as a Scientific Enterprise’** was organized at the National Institute of Advanced Studies (NIAS), Bengaluru, in collaboration with CSIR-NISTADS, on August 22, 2016.

The emergence of BRICS has added new opportunities and dimensions, shaping the economic, social and political future of the world. India’s strategic partnerships within BRICS

framework gained significant momentum in 2016 with India as the BRICS Chair. The focus for 2016 BRICS deliberations has been on ‘Building Responsive, Inclusive, Collective Solutions’. In that context, CSIR-NISTADS and NIAS jointly organized a national discussion on BRICS Science & Technology Enterprise Partnership (BRICS-STEP) in August, 2016 with an objective to prepare a document from India exploring BRICS as a scientific enterprise. The report aimed at creating a structure for a BRICS-STEP by identifying salient elements to create a sustainable, growth-oriented BRICS initiative. Many scientists from NISTADS along with its Director participated in the meeting.

LECTURES ORGANISED

VIDEO CONFERENCE TALK ON 'SEIQA: LESSONS FROM CSIR EIA AND THE WAY FORWARD'

*By Dr. Manisha G. Singh, New Delhi
On October 18, 2016 (Tuesday)*

The Socio-economic Impact Assessment is the quantification of impact, that is, the change in outcomes obtained due to intervention. In other words, what is it that would have been lost if the intervention had not been made. It is typically carried out for social programmes, where returns on public investment are not accruing directly to the funder as in the case of a government financing of a job training activity or a rural employment scheme. It is now being carried out by organizations to gauge the impact of their commercial activities beyond the visible return to the organization itself. One such exercise was carried out by the CSIR for its selected commercialized technologies. The results highlighted the dilemma of commercializing technology with low licensing and royalty fees and making the

end product more affordable versus charging higher fees and maximizing return.

Affordability is access. This insight is obtained from the study of streptokinase, a biotechnology based drug, in India. The market availability of this clot-buster life-saving drug in India can be divided into two phases: before and after a CSIR national laboratory licensee's streptokinase availability. Before its introduction, about 20,000 vials of standard dosage (1.5 miu) were imported and made available domestically. After its introduction, its availability increased overtime to 120,000 vials of standard dosage. The six-fold increase in availability came about in parts due to low royalties on technology payable to the CSIR lab. This seminar shared an overview of the CSIR Economic Impact Assessment of selected commercialized technologies and discussed possible ways to build institutional capacity for impact assessment.



BITS SEMINAR

Three students from the Birla Institute of Technology and Science (BITS), Pilani, joined CSIR-NISTADS for six months' training of PS II in July, 2016. The students – Prasna Pinnika, Bhanu Prakash Reddy and Smarth Kakkar – delivered talks on December 8, 2016, on the following topics:

- (i) Renewable Energy in the BRICS Countries/Technology Navigator;
- (ii) Futuristic Optimised Smart City Mobility; and
- (iii) Social Network Analysis on Renewable Energy Research in India.

OUTREACH PROGRAMME

Outreach Programme

- Lectures organised in the Techno-Foresight series = 5
- Debates held under the policy debate programme Vitarka = 5

OUTREACH PROGRAMME

A CSIR-NISTADS outreach programme was launched on Technology Day, May 11, 2016. It is a public discussion forum with

two components: Techno-Foresight: Technology of Future; and Vitarka: Policy Debate.

TECHNO-FORESIGHT: TECHNOLOGY OF FUTURE

Coordinator: Dr. Tabassum Jamal



"India can become a global innovation leader provided we have 'technology foresight' to make the right technology choices, provided we introduce 'coherent synergy' in our science and technology related activities and provided we establish an effective 'innovation ecosystem': Dr. R. Chidambaram, Principal Scientific Adviser to the Government of India.

TECHNO-FORESIGHT provides a process for linking science and technology more effectively to wealth creation and improvements in the quality of life. Proactive and far-sighted planning of Science & Technology can be a powerful engine of progress. Techno-Foresight, a public discussion launched by CSIR-

NISTADS aimed at enhancing the level of awareness among the people and holding discussions on future science and technologies that will have transformative effects. The goal was to create both awareness and advocacy for a future-ready India. Techno-Foresight aimed to organize exposure-discussion on concepts and

products that are in the far horizons of science and technology, but have high socio-economic implications. CSIR-NISTADS invited all stakeholders for their views, contribution and participation. Several Techno-Foresight sessions were organized at the India International Centre (IIC), New Delhi. The following lectures were organised in this series:

The inaugural lecture on 'Life Spans of Future: Science and Socio Economics', was given by Dr. P. Goswami, Director, CSIR-NISTADS, on July 8, 2016. Dr. Goswami started the discussion with a brief



introduction on the Techno-Foresight session. He said that it was necessary to have open thinking, the power of imagination and importance to inculcate the spirit of Techno-Foresight. According to him, the aim behind this initiative is to bring imagination into thinking power for various ideas without any conceptual barriers. The discussion on the lecture mainly centred around some basic questions like -- how long will people live 50 years from now? What will be the society like then? How prepared are we for this? The primary objective of the lecture was to highlight the effects on the social, political and economic structures of the world.



A lecture on '3D Printing', by Dr. Sourabh Ghosh, Associate Professor, IIT-Delhi, New Delhi was held on August 10, 2016. Dr. Ghosh elaborated on some stupendous progress their lab has made in 3D bio-printing. He said that in order to solve various problems posed by traditional polymers used as scaffolding material, their lab has adopted the silkworm-inspired method of printing by using silk proteins as the ink. He explained the recent progress in technology, which has enabled cells to retain their differentiation properties and to develop into stable tissues.

Another lecture, on the topic 'Food Without Open Agriculture', delivered by Dr. Prashant Goswami, Director, CSIR-NISTADS, was held on September 15, 2016. It was suggested that CSIR-NISTADS should consider and think about



Android Agriculture, where food can be produced by various simple applications, and also discussed about various technological approaches like single cell approach, solar agriculture and fermentation process. Major recommendations and follow-up ideas emerged from the discussion. It was felt that technological readiness of paramount importance; there is also a need to look for bio-engineered agriculture; and focus must be on removing conceptual barriers like technological gaps, etc.



A lecture on 'Forecasting Social Behaviour', by Dr. Aparna Basu, formerly Scientist at NISTADS, was delivered on October 13, 2016, and the discussion continued on the same topic on November 30, 2016. The discussion mainly centred on

some basic questions like 'Want to predict human behaviour?' What risks are incurred in forecasting human behaviour? How prepared are we for this?' etc.

The primary objective of the lecture was to highlight the effects on the analysis of forecasting human behaviour. Methods of predicting behaviour involves making prediction from past data and prediction for the present and see whether it is good or not. Forecasting or predicting social behaviour involves taking all collective reactions of society. Some of the major recommendations were to 'Undertake a comprehensive review of data collection in the light of forecasting needs', and 'Data that enhance forecasts should be widely available and be disseminated on a timely basis'. All the lectures were provided with the major recommendations and follow-up plans. The programmes were attended by experts from research organizations, universities, AIMS, a few ministries and NISTADS S&T staff. A large number of students from JNU, Delhi University and AcSIR also participated. The events got coverage by media like Bloomberg.



Participants during one of the lectures of Techno-Foresight

VITARKA: POLICY DEBATE

Coordinator: Dr. Mohd. Rais



An active and inclusive public debate can make significant contribution to policy formulation and policy advocacy. CSIR-NISTADS launched a public discussion forum Vitarka, the primary goal of which was to engage the public in policy debate for techno-socio-economic transformation, especially through S&T intervention. It was planned as an open environment platform for informative and participative discussion. CSIR-NISTADS invited public and stakeholders for their views, contribution and participation in this techno-socio-economic development initiative. The Vitarka, in return, greatly benefited from their contributions and participation. The topics planned under Vitarka ranged from Clean Water, Carbon

Taxes, Energy, GM Crops, and Stem Cell Research, to Space Mission and Nuclear Policy. People participated in Vitarka by direct invitation or by selection from requests received through web registration (www.nistads.res.in).

The debates consisted of two groups, i.e., Against the motion and For the motion. Every debater in each group was given a particular time to express his or her views. All these debates were followed by major recommendations and follow-up plans. Following were the Vitarka discussions held at the India International Centre (IIC), New Delhi:

The topic of the first discussion was 'India Should Support Large Homogenous

Agriculture Against Small Diversified Agriculture’, which was held on July 20, 2016. The debate was moderated by eminent scientist Dr. Amit Kar, Head of Division of Agricultural Economics, Indian Agricultural Research Institute (IARI). This debate comprised three sessions that focused on the S&T and policy aspects. Dr. P. Goswami, Director CSIR-NISTADS, chaired the session and introduced the topic to the debaters and audience, highlighting the need of policy intervention in the present-day farming practices. Dr. Amit Kar also gave his inputs on the current agriculture situation and decreasing land holding size of India. The debate distinctly brought out the merits of large homogeneous agriculture over small diversified ones.



The second debate was on the subject ‘India’s Current Agricultural Trade Policy is not Water Sustainable’, held on August 24, 2016. Dr. P. Goswami, Director, CSIR-NISTADS, chaired the session while Dr. M. Rais coordinated the event. The debate was moderated by eminent scientist Dr. K.P. Vijay Lakshmi from Jawaharlal Nehru University (JNU), New Delhi. Dr. Goswami addressed that the virtual water trade can be made as an initiation point for policy intervention to make India’s agriculture export water sustainable. Further, he tried to convey a clear idea about virtual water trade – how it plays an



important role in water sustainability of India, what are the different agricultural trade policies and how are they affecting water sustainability, etc. The participants were from diverse fields including policy makers, agricultural scientists, professors, environmentalists, NGOs, students and journalists. It was recommended that virtual water trade between or within nations can be an alternative to real, inter-basin water transfers. Major recommendations and follow-up ideas that emerged from the debate were: Export/import is not limited to the geographical boundaries; to think globally, the virtual water export issues need to be taken into account while making policies; more efficient use of water is required in agriculture; adjust the products that India exports and imports so that there is net import of water; and need regional balance, not just country-wise balance, since water is an essential commodity.

On September 28, 2016, the debate was on the topic ‘India could Improve its Water



Use Efficiency’. Prof. Man Singh, Water Technology Centre, ICAR-IARI, gave a brief introduction and raised many crucial aspects of water policy, such as, whether water is a public commodity or not and how water cannot be seen only in a technical manner. He also pointed out that many Indian tribunals have been set up over the years but they are unable to resolve the issues. In conclusion, it was suggested that techniques such as rain water harvesting should be encouraged and focus should be given on developing new technologies for underground water restoration. Regulations on usage of underground water should be made very strict to prevent overexploitation, he suggested during his speech.



A debate on ‘India’s R&D System is well designed for delivery’ was held on November 9, 2016. Dr. Naresh Kumar, Scientist from CSIR-NISTADS opened the discussion by giving an overview of the current R&D system in India. He also described the factors responsible for low R&D output in the country and also suggested measures which can be taken to improve the current R&D scenario in the country. Mirza Arib, an independent innovator pointed towards the gap between scientists, innovators and patenting system which leads to a gap between ideas and implementation, dreams and delivery. Further it was mentioned that the existing R&D system should be redesigned to suit

the current-day needs. The other participants emphasised on the need to streamline transfer of institutional output to the industry. An important point that came out of the discussion was the excessive reliance of people on foreign technology, which is usually knowledge intensive. In many cases indigenous products are rejected outright over foreign products. This attitude deals a fatal blow to the Indian companies and also discourages indigenous knowledge base and commercial R&D. It was concluded that policies have to be designed to encourage and promote Indian technological products, which will also help in the “Make in India” project.

The Vitarka’s final debate, on ‘Ground Water Should be Considered Only as a Community Wealth’, was held on December 14, 2016. The debate was appropriate, considering that around the world, community wealth development is being considered as a mechanism for equitable and more sustainable development. An approach suggested during the discussion was to segregate water use based on the purpose, i.e. routine house cum sanitation requirements and use in industry and agriculture. It was further mentioned that differential tariff can be levied upon these two categories and the revenue collected can be utilized for water supply, recycling and recharging facility development. For a tidy implementation a public-private partnership model for water supply can be devised and followed. Some of the major recommendations and follow-up of this debate were: Generating awareness for conservation among the community; Offering visible benefits to individuals contributing in water harvesting; Inventing laws for responsible use of resources; Use of new technologies like GIS to monitor availability of water in community owned aquifers; etc.



Participants during one of the Vitarka debate

CSIR-NISTADS IN NEWS

CSIR-NISTADS IN NEWS

Engineering is most impactful field of research in...

<http://www.livemint.com/Politics/Sy9JEwRdWovi...>

live
mint

Print Close

Tue, May 10 2016. 02 02 AM IST

Engineering is most impactful field of research in India: report

Research in chemistry and pharmacology most cited; India's share of patent citations was at 2.9% in 2013, says study



Photo: Hemant Mishra/Mint

India's most impactful field in terms of research output is engineering while its most prolific in terms of citations are chemistry and pharmacology, according to the Elsevier Report 2016, commissioned by the Department of Science and Technology.

The report looked at India's contribution in the field of science and technology in terms of volume of research papers, global share and citation impact.

The report said India's scientific publications grew 13.9%, as against the global average of 4.1%, during 2009-13.

Various indicators show India has a small but growing share of the world's total scholarly output.

India's share of the world's science and technology scholarly output has grown from 3.1% in 2009 to 4.4% in 2013—from 62,955 papers in 2009 to 106,065 papers in 2013.

Scopus is Elsevier's abstract and citation database of peer-reviewed literature and covers 60 million documents published in over 22,000 journals, book series and conference proceedings by nearly 5,000 publishers.

India's share of the world's patent citations increased from 2.2% in 2009 to 2.9% in 2013.

"Although India is still a relatively small player on the global scientific stage, its wide-ranging collaboration network and increasing share of the world's main research performance indicators reflect its overall growth in output, impact and knowledge transfer," said the report.

In terms of knowledge transfer, India shows a higher emphasis in areas of computer science, material science, chemistry and pharmacology, toxicology and pharmaceuticals. Knowledge transfer includes analyses of patent citation patterns and collaborations between academic and corporate research institutions.

"As a whole, there is a promising trend as more Indian research is included in global journals and more institutes are regularly making appearances in such databases. It has also been seen that collaboration is expanding to not just include OECD (Organisation for Economic Cooperation and Development) partners, but others such as Brazil, China and Iran," said Sujit Bhattacharya, senior principal scientist, Council of Scientific and Industrial Research-National Institute of Science, Technology and Development Studies.

Bhattacharya, however, added that publishing in high-impact journals is not visible to the extent one would expect from a country like India.

"There could be many reasons for this. Either papers have not reached the required mark or there are also cultural barriers that developing countries such as India face when it comes to citations," he said.

Standout institutes

The Indian Institute of Science, Bangalore, is the most prolific and in the most number of subjects, with the highest number of publications between 2009 and 2013 in six of the 16 subject areas, which include physics and astronomy, biochemistry, genetics and molecular biology, material science, chemistry, mathematics, and earth and planetary sciences.

The Indian Institute of Technology, Kharagpur, has the most publications in engineering and chemical engineering, and the Indian Institute of Technology, Delhi, has the most in the energy area.


18th July, 2016, Page: 1

Nation That Suffered Worst Drought in Decades Is Water Exporter

CSIR-NISTAD



Workers unload wheat at a grain market in Karnal, Haryana.

Jaiveer Arya wipes sweat from his brow as he squats in the shade and watches workers weigh his wheat crop at a grain market in India's northern Haryana state. He's hoping for a good price from exporters.

Unseen in Arya's 850 kilograms of wheat is about 128 kilograms of water that's embedded within the food. Arya and millions of farmers like him in India account for about 2.5 percent of global agriculture exports, meaning that a large amount of water embedded in produce is shipped overseas and lost for good by a nation still emerging from one of its worst droughts in decades.

- India ships out large amounts of water embedded within grains
- That's adding to the challenge of managing depleting supplies

"We export agriculture products without any thought," said Prashant Goswami, director and climate scientist at CSIR-National Institute of Science, Technology and Development Studies in New Delhi. "When water is embedded in a product that's exported, it's lost forever. That's a bigger danger for our water."

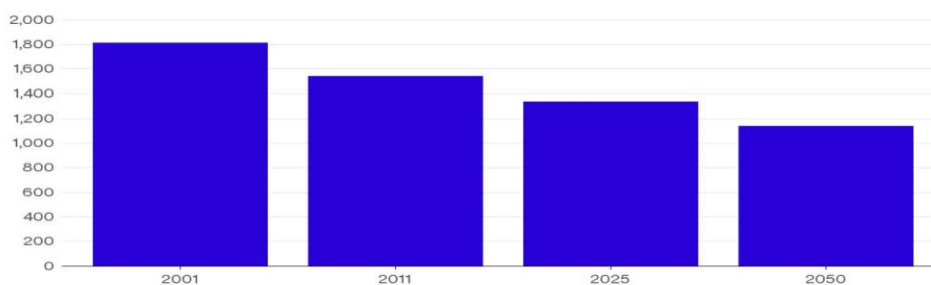
Produced by Unit for Science Dissemination, CSIR, Anusandhan Bhawan, 2 Rafi Marg, New Delhi


18th July, 2016, Page: 2

Water Stress

Available Indian water supply is declining

■ Per capita average annual availability (m³/year)



Source: Projections by United Nations agencies
A level of 1,000 is classified as water scarcity

Bloomberg

Goswami estimates India could exhaust available water supplies in less than 1,000 years because of net exports of food such as rice and wheat. He argues officials must change farming policies to turn the deficit in trade in embedded water into a surplus. Growing demand from industry and the nation's 1.3 billion people is also adding pressure for better management of the resource.

Produced by Unit for Science Dissemination, CSIR, Anusandhan Bhawan, 2 Rafi Marg, New Delhi



13th July, 2016, Page: 3

Rice Sales



India -- the world's top rice exporter -- shipped agricultural commodities worth more than 2.6 trillion rupees (\$39 billion) overseas in 2013-2014, government data show. The nation exported about 25 cubic kilometers of water embedded in its agricultural exports in 2010. That's enough water to meet the needs of nearly 13 million people.

Hundreds of millions of people in India grappled this year with one of the country's worst droughts in decades, following two years of poor rainfall and the onset of intense summer heat. The June-September monsoon is bringing some relief, but a longer-term challenge looms from competition for supplies.

Arya, 44, grows both rice and wheat in his 10-acre smallholding near the border of Haryana and Uttar Pradesh states. Another common crop in the region is water-intensive sugar cane.

Speaking at the market in May, Arya said he draws water from a 170-foot well for irrigation, five times deeper than when his father tilled the farm. He added that he's had to bore deeper three times in the last five years.

Unseen Depletion

Policies that effectively provide farmers with free water as well as free electricity to run pumps are stoking over-exploitation, according to Ashok Gulati, an agriculture economist and former chief of India's Commission for Agricultural Costs and Prices.

"Who has seen the future?" he asked. "Farmers can't see how much water's being depleted underground."

Produced by Unit for Science Dissemination, CSIR, Anusandhan Bhawan, 2 Rafi Marg, New Delhi


13th July, 2016, Page: 4


Water commuters wait in line to fill containers at the Vivekananda Chowk water tank in Latur, Maharashtra.
Photographer: Dhiraj Singh/Bloomberg

India is one of the world's biggest users of groundwater, and the World Resources Institute estimates more than half of the nation faces high water stress. A 2009 study by the University of California, Irvine, and the National Aeronautics and Space Administration showed groundwater depletion in northwestern India from 2002 to 2008 was equivalent to a net loss triple the capacity of Lake Mead, the largest man-made reservoir in the U.S.

Import Flood?

One possible policy step for Asia's No. 3 economy is to curb sugar cane subsidies and abolish levies on imports of the sweetener, to encourage farmers to grow crops that need less water, Gulati said.

"Let imports flood the market," he said.

India could learn from China, according to Goswami, who's published his work on embedded water in the journal Nature along with co-author Shiv Narayan Nishad, a mathematician at the M.S. Ramaiah University of Applied Sciences in Bengaluru.

China imports more water-intensive produce while exporting food that uses less water, their research shows. "Policy makers need to sit down and ensure that we import food in such a way that we bring in more water," Goswami said. "The world is no longer innocent of this virtual water trade."

<http://www.bloomberg.com/news/articles/2016-07-11/nation-that-suffered-worst-drought-in-decades-is-water-exporter>

Archana Chaudhary & Pratik Parija | July 12, 2016

Produced by Unit for Science Dissemination, CSIR, Anusandhan Bhawan, 2 Rafi Marg, New Delhi



Knowledge Management

- **PROJECT MONITORING & EVALUATION (PME)**
- **LIBRARY**
- **IT INFRASTRUCTURE**
- **RESEARCH COUNCIL**
- **MANAGEMENT COUNCIL**
- **RIGHT TO INFORMATION ACT (RTI) CELL**
- **BUDGET**
- **हिंदी की गतिविधियां**
- **STAFF LIST**

PROJECT MONITORING & EVALUATION (PME)

NISTADS has a PME Division comprising of the following members:

- Dr. Vipin Kumar, Head PME and Principal Scientist
- Dr. Madhulika Bhati, Scientist
- Anil Kr. Sharma, Sr. Tech. Officer (3)
- Dr. Anil Kumar, Sr. Tech. Officer (1)
- Shri J.S. Narula, Sr. Technician (2)
- Ms. Tara Verma, Sr. Technician (2)

The main activities of the PME Division include:

- Monitoring and evaluation of grant-in-aid projects
- Monitoring and evaluation of CSIR projects i.e. MLP, OLP, etc.
- Organizing training programmes for students from BITS, IIT and other reputed institutions
- Arranging training programmes for faculty
- Acting as the nodal point between the Institute and the CSIR headquarter for

timely delivery of the queries related to projects, Parliament questions and any other issues pertaining to R&D activity of **CSIR-NISTADS**

- **Preparation and timely maintenance of databases for all intramural and extramural research projects**
- Dissemination of information on all relevant national and international research programme requests, including fellowships and maintenance of the NISTADS' required registration with such agencies as mandatory, and liaison with grant-giving agencies
- Guiding fresh scientific personnel in the preparation and submission of project proposals
- Preparation of RC agenda, convening RC meetings and keeping the record and database of all the RC activities. Participation in the Institute's annual plan and budget preparations, as well as annual reporting, which are the mandatory activities of the division.

LIBRARY

CSIR-NISTADS library is a national resource centre in the Science Technology Society/Science Technology Innovation areas. It has a diverse collection of books, archival materials, reports and handbooks in this area. The library subscribes primarily to journals covering the key contemporary trends in this area. The book and journal collection has built up over the years. At present, the library has around 26,000 books, including books in Hindi and some in other languages. Keeping the increasing research focus on innovation and growth, sustainability, climate change, health among others, the library this year has focused on expanding its collection in these domains. A total of 176 books,



including handbooks primarily focusing on these areas and some new journals and scholarly magazines have been added this year. In addition, the library has also subscribed to two newspapers in Hindi language and a few popular magazines published in Hindi and English.

Knowledge Resource Centre Advisory Committee

- | | | |
|---------------------------|---|------------------------|
| 1. Dr. Sujit Bhattacharya | : | Chairperson |
| 2. Dr. Y. Madhavi | : | Member |
| 3. Dr. Naresh Kumar | : | Member |
| 4. Dr. Kasturi Mandal | : | Member |
| 5. Dr. Suman Ray | : | Member |
| 6. Dr. Praveen Sharma | : | Member |
| 7. Sh. Kashmiri Lal | : | Member |
| 8. Dr. Suresh Kumar | : | Convener and Head, KRC |

Library staff

1. Dr. Anita Bali
2. Sh. R. K. Nagarwal
3. Sh. Shiv Singh Negi

IT INFRASTRUCTURE

CSIR-NISTADS has self-designed and hosted a bilingual website which is running on the Linux server, an open source software (OSS) and is on Joomla platform. Joomla is a content management system (CMS) and an open source software that supports pictures, texts and videos. Our website is being regularly updated. We have our own Linux-based DNS server installed at the Institute. Our Institute has email addresses for all staff members from NIC with nistads.res.in as the domain name.

We have HP 40 Gbps Core Switch and Edge switches for our network infrastructure. The network backbone is on optical fiber & the end-to-end connectivity is 10 Gbps. The optical fiber network is from Server Room to Umbrella, Administrative Block, Second Floor and Library. The Institute has controller-based Wi-Fi internet connectivity in the campus through secured login. We also have 30 KVA three-phase online UPS in the Server Room which provides uninterrupted power supply to IT equipment round the clock.

CSIR-NISTADS has one Gbps leased line from National Knowledge Network (NKN). The NKN is a state of the art multi-gigabit pan-India network for providing a unified high-speed network backbone for all

knowledge related institutions in the country.

CSIR-NISTADS has Sophos Cyberoam, Unified Threat Management (UTM) Appliance. We have about 150 desktops, 40 laptops as well as a few workstations having secure internet access. The systems and servers are protected with Trend Micro Worry Free Business Security which is a client-based antivirus that prevents the systems from being attacked by unauthorized entities and helps them run smoothly and safely.

CSIR-NISTADS has excellent video conferencing and audio-visual facility with latest equipments. We also have a state of the art conference hall. CCTV and Biometric Attendance System have been installed at the Institute. The Institute also has a video wall at the Reception.

This institute has Intel Xeon 12 core processor based servers. These servers are used for a variety of services like website, FTP, DNS, antivirus and application servers. These servers are running on Windows and Linux operating systems to meet the requirements of our organization. We are using various application softwares to meet the requirements of our research and analysis.

RESEARCH COUNCIL

With effect from August 1, 2013

CHAIRMAN

Prof. Ashoka Chandra

Principal Advisor,
International Management Institute, India
B-10, Qutab Institutional Area,
Tara Crescent,
New Delhi-110 016

MEMBERS

Prof. C.A. Murthy

Machine Intelligence Unit
Indian Statistical Institute
203 B.T. Road,
Kolkata-700108

Prof Anand Patwardhan

SJM School of Management
Indian Institute of Technology Mumbai
Powai,
Mumbai-400076

Prof. Manoj Panda

Director
Institute of Economic Growth
University of Delhi Enclave,
North Campus,
Delhi-110007

Dr. Rangan Dutta

Former DG, CAPART & Secretary to Govt
of India, C-106 Sector 40
Noida-201303

Shri Manab Majumdar

Assistant Secretary General
Federation of Indian Chambers of
Commerce and Industry
Federation House
Tansen Marg,
New Delhi-110001

Prof. Pranav Desai

Professor of Economics
Centre for Studies in Science Policy
School of Social Sciences-1
Jawaharlal Nehru University,
New Delhi.

Prof. Rahul Varman

Dept of Industrial & Mgmt. Engineering
Indian Institute of Technology
Kanpur-208 016

AGENCY REPRESENTATIVE

Dr. S.S. Kohli

Scientist F, SERC Division
Department of Science & Technology
Technology Bhawan,
New Delhi-110016

Dr. Kamini Mishra

Scientist F,
Department of Science & Technology
Technology Bhawan,
New Delhi-110016

DG NOMINEE

Dr. R.R. Hirwani

Head, CSIR- Unit for Research and
Development of Information Products
Jopasana, 85/1 Paud Road
Pune-411038

SISTER LABORATORY

Dr. S. Gangopadhyay

Director
CSIR-Central Road Research Institute,
Delhi-Mathura Road,
New Delhi-110020

CLUSTER DIRECTOR

Prof. P. Seshu

Head, CSIR-Fourth Paradigm Institute
NAL Belur Campus,
Bengaluru-560037

DIRECTOR

Dr. P. Goswami

National Institute of Science, Technology
and Development Studies
Dr. K.S. Krishnan Marg
New Delhi 110012

PERMANENT INVITEE

Head or his Nominee

Planning & Performance Division
Council of Scientific & Industrial Research
Anusandhan Bhawan, 2 Rafi Marg
New Delhi 110001

CONVENER

Dr. Vipin Kumar

Head, PME, CSIR-NISTADS

RC Meetings held during this period:

- The 35th RC meeting held on April 11, 2016.
- The 36th RC meeting held on July 12, 2016

MANAGEMENT COUNCIL

January 1, 2016 to December 31, 2017

CHAIRMAN

Director

CSIR-NISTADS

Director

CSIR-NISCAIR, New Delhi

MEMBERS

Dr. G.D. Sandhya

Chief Scientist

Dr. R.R. Hirwani,

Head, URDIP, Pune

Dr. Naresh Kumar

Sr. Principal Scientist

Dr. Vipin Kumar

Principal Scientist & Head, PME

Dr. Kasturi Mandal

Scientist

COFA/FAO

CSIR-NISTADS

Dr. Suman Ray

Scientist

MEMBER-SECRETARY

Controller of Admn./Admn. Officer

CSIR-NISTADS

Shri Anil Kumar Sharma

Sr. Technical Officer

MC Meeting held during this period:

- The 32nd MC meeting, held on May 27, 2016
- The 33rd MC meeting, held on January 25, 2017

RIGHT TO INFORMATION ACT (RTI) CELL

Appellate Authority:

Dr. Md. Rais

Senior Principal Scientist

Email: rais@nistads.res.in

Ph. (Off): 2584 3052

Public Information Officer (w.e.f.

January 24, 2017)

Shri Kashmiri Lal

Sr. Technical Officer (3)

Email: kashmirilal@nistads.res.in

***Public Information Officer (till January
24, 2017)***

Mr Rammi Kapoor

Principal Technical Officer

Email: rammi@nistads.res.in

Ph. (Off): 2584 3044

Nodal Officer for RTI Activities

Mr. Brij Bihari

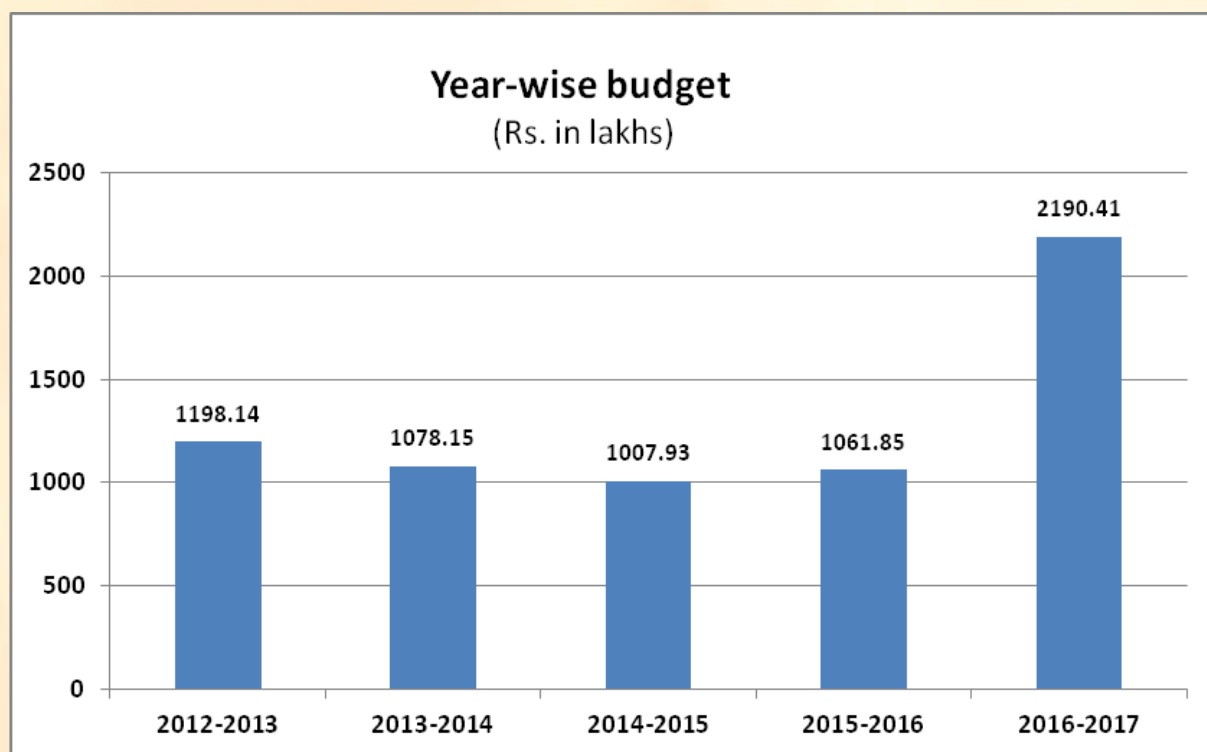
Section Officer

Email: brijbihari@nistads.res.in

Ph: 011-25843072

BUDGET FOR LAST FIVE YEARS

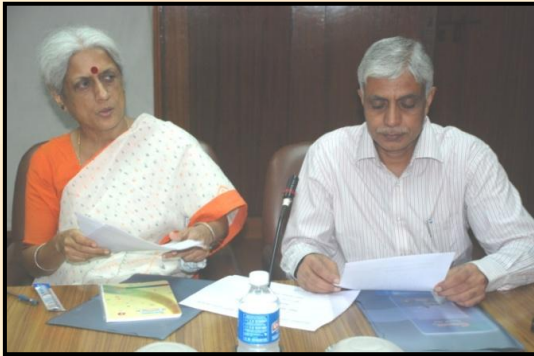
Year	Total Budget (Rs. in lakhs)
2012-2013	1198.14
2013-2014	1078.15
2014-2015	1007.93
2015-2016	1061.85
2016-2017	2190.41



हिंदी की गतिविधियां

हिंदी की गतिविधियां

सीएसआईआर - राष्ट्रीय विज्ञान, प्रौद्योगिकी और विकास अध्ययन संस्थान) निस्टैड्स(, नई दिल्ली में दिनांक 01/04/2016 से 31/03/2017 तक की अवधि में विभिन्न अनुभागों द्वारा द्विभाषी (हिंदी-अंग्रेजी) रूप में जारी किए गए अनेक कार्यालय ज्ञापनों, परिपत्रों, प्रैस विज्ञप्तियों, निविदा सूचनाओं तथा अन्य कार्यालयों को हिंदी में भेजे गए पत्रों/ईमेल एवं फाइलों में लिखी गई टिप्पणियों, लिखे गए चेकों और अनुभागीय रजिस्ट्रों में की गई प्रविष्टियों आदि के अतिरिक्त, राजभाषा कार्यान्वयन से संबंधित अन्य गतिविधियां निम्न प्रकार हैं-



हिंदी पखवाड़ा (दिनांक 31-8-2016 से 14-9-2016) का उद्घाटन करती हुई डा. (सुश्री) एन. मृणालिनी, प्रमुख वैज्ञानिक(बाएं) तथा मंच पर उपस्थित डा. मुहम्मद रईस, वरि. प्रधान वैज्ञानिक(दाएं)

- निस्टैड्स की राजभाषा कार्यान्वयन समिति की त्रैमासिक बैठकों का आयोजन:
 - दिनांक 20/5/2016; ii) दिनांक 29/8/2016; iii) दिनांक 29/11/2016; और iv) दिनांक 28/2/2017
- हिंदी प्रगति मॉनीटरिंग समिति द्वारा सभी अनुभागों के हिंदी संबंधी कार्यों का भौतिक सत्यापन/ जांच:
 - i) दि.04/04/2016; ii) दि.02/05/2016; iii) दि.03/06/2016; iv) दि.11/07/2016; v) दि.10/08/2016; vi) दि.05/09/2016; vii)

दि.13/10/2016; viii) दि.02/11/2016; ix) दि.15/12/2016; x) दि.10/01/2017;

- वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद, नई दिल्ली और उत्तरी क्षेत्रीय कार्यान्वयन कार्यालय-1(दिल्ली), राजभाषा विभाग, नई दिल्ली को निम्नलिखित तिमाही हिंदी प्रगति रिपोर्ट भेजी गई:
 - i) 01 अप्रैल - 30 जून, 2016; ii) 01 जुलाई - 30 सितंबर, 2016; iii) 01 अक्टूबर - 31 दिसंबर, 2016; और iv) 01 जनवरी - 31 मार्च, 2017।
- उपनिदेशक (कार्यान्वयन), उत्तरी क्षेत्रीय कार्यान्वयन कार्यालय-1(दिल्ली), राजभाषा विभाग (गृह मंत्रालय), भारत सरकार, सरोजिनी नगर, नई दिल्ली, ने दिनांक 13/04/2016 को सीएसआईआर- राष्ट्रीय विज्ञान, प्रौद्योगिकी और विकास अध्ययन संस्थान, नई दिल्ली का राजभाषा संबंधी निरीक्षण किया।
- निस्टैड्स के अधिकारियों एवं कर्मचारियों के लिए निम्नलिखित आयोजन किए गए:
 - दिनांक 29-6-2016 को 'कंप्यूटर पर यूनिकोड का प्रशिक्षण' (प्रशिक्षक- श्री अरविंद कुमार भारद्वाज, वरिष्ठ तकनीकी अधिकारी(3), सीएसआईआर-निस्टैड्स, नई दिल्ली)



हिंदी कार्यशाला (दि. 28-12-2016) में 'राजभाषा नीति और कार्यान्वयन' पर हिंदी में चर्चा करते हुए डा. प्रेम सिंह, पूर्व संयुक्त निदेशक, केंद्रीय हिंदी प्रशिक्षण संस्थान, राजभाषा विभाग, नई दिल्ली

- दिनांक 28-12-2016 को हिंदी कार्यशाला के अंतर्गत 'राजभाषा नीति और कार्यान्वयन' पर हिंदी में विस्तृत चर्चा (वक्ता- डा. प्रेम सिंह, पूर्व संयुक्त निदेशक, केंद्रीय हिंदी प्रशिक्षण संस्थान, नई दिल्ली)



हिंदी कार्यशाला (दि. 23-03-2017) के दौरान 'राजभाषा और दायित्व' पर चर्चा करते हुए डा. पूरन पाल, वरि. हिंदी अधिकारी (एसजी), सीएसआईआर, नई दिल्ली (दाएं) तथा मंच पर उपस्थित डा. जी. डी. संध्या, प्रमुख वैज्ञानिक (बाएं)

- दिनांक 23-03-2017 को हिंदी कार्यशाला के अंतर्गत 'राजभाषा और दायित्व' पर हिंदी में विस्तृत चर्चा (वक्ता- डा. पूरन पाल, वरि. हिंदी अधिकारी (एसजी) सीएसआईआर, नई दिल्ली) एवं 'विज्ञान के प्रचार-प्रसार में यू ट्यूब का योगदान' पर चर्चा (वक्ता- डा. अनित बाली, वरि. तकनीशियन(2), सीएसआईआर-निस्टैड्स, नई दिल्ली)



दिनांक 14-9-2016 को 'हिंदी पखवाड़ा समापन समारोह, 2016' के अवसर पर आमंत्रित मुख्य अतिथि श्री जेनेन्द्र कर्दम जी (मंच पर बाएं) का परिचय कराती हुई डा. जी. डी. संध्या, प्रमुख वैज्ञानिक (दाएं)

'हिंदी दिवस' (14 सितंबर) के उपलक्ष्य में निस्टैड्स में दिनांक 31-8-2016 से 14-9-2016 तक की अवधि में 'हिंदी पखवाड़ा' मनाया गया। इस दौरान संस्थान के अधिकारियों एवं कर्मचारियों के लिए अनेक हिंदी प्रतियोगिताओं का आयोजन किया गया। दिनांक 14-9-2016 को 'हिंदी पखवाड़ा समापन समारोह' मनाया गया। इस अवसर पर मुख्य अतिथि के रूप में हिंदी के प्रसिद्ध विद्वान एवं कवि श्री जेनेन्द्र कर्दम जी को आमंत्रित किया गया।

नोट: अधिक जानकारी के लिए कृपया निस्टैड्स वेबसाइट www.nistads.res.in पर उपलब्ध हिंदी गतिविधियां देखें।

STAFF LIST

STAFF LIST

Director

Dr. P. Goswami

Chief Scientist

Dr. N. Mrinalini (retired on 30.11.2016)
Ms. Anuradha Singh (retired on 31.8.2016)
Dr. G.D. Sandhya
Dr. Tabassum Jamal

Senior Principal Scientist

Dr. Sanjib Pohit (resigned on 14.9.2016)
Dr. Sujit Bhattacharya
Dr. Mohammed Rais
Dr. Y. Madhavi
Dr. Naresh Kumar

Principal Scientist

Dr. L. Pulamte
Dr. S. Rajeswari (voluntary on 1.10.2016)
Dr. Vipan Kumar
Dr. Yogesh Suman
Ms. Sandhya Wakdikar

Scientist

Dr. Madhulika Bhati
Shri Avinash Prasad Kshitij
Dr. Kasturi Mandal
Dr. Suman Ray

Principal Tech. Officer, Group III(7)

Shri Rammi Kapoor (retired on 31.3.2017)

Sr. Technical Officer (3), Group III(6)

Shri Anil Kr. Sharma
Shri A.K. Bhardwaj
Dr. Suresh Kumar
Shri Kashmiri Lal
Dr. Praveen Sharma

Sr. Technical Officer (2), Group III(5)

Ms. Renu Jethi
Ms. Mala Bahl (retired on 31.10.2016)

Sr. Technical Officer (1), Group III(4)

Dr. Anil Kumar (joined on 2.2.2017,
transferred from NBRI, Lucknow)

Sr. Technician (2), Group II (4)

Dr. Anita Bali
Ms. Tara Verma
Shri N.K. Prashar
Shri J.S. Narula
Shri R.K. Nagarwal
Shri Bharat Lal (voluntary on 2.7.2016)

Lab. Assistant, Group I(4)

Shri Madan Kumar
Shri Dheeraj Pal
Shri Ram Suphal
Shri K.C. Joshi

Lab. Attendant, Group I(3)

Shri Shiv Singh Negi
Shri Sunder Lal (retired on 31.7.2016)
Shri Murli Dhar

Controller of Administration

Shri Bijender Kumar (joined on 9.12.2016
and transferred on 9.1.2017)

Administrative Officer

Ms. Mercy Joseph

Finance & Accounts Officer

Shri Jai Prakash Indora

S&PO

Shri Laljasei Misao

Section Officer (Gen.)

Shri Brij Bihari
Shri A.K. Handa (joined on 1.4.2016)

Section Officer (F&A)

Shri Ankur Jain (joined on 1 Apr. 2015)

Hindi Officer

Shri Virpal Singh

Private Secretary

Shri Harpal Singh (joined on 1 Apr. 2015)
Shri Mohan Lal
Shri Ved Prakash

Assistant (Gen) Grade-I

Shri Anil Kumar
Ms. Rajinder Kaur (retired on 31.12.2016)
Shri Manish Kumar Mehta
Shri N.A. Khan
Shri Pretesh Kumar
Shri Mohd. Idrees
Shri Surinder Pal

Assistant (F&A) Grade-I

Shri Anisur Rehman

Assistant (S &P) Grade-I

Ms. Indira Jain
Shri Rakesh Kumar Mago

Assistant (F&A) Grade-II

Shri M.S. Rawat
Shri Narender Singh

Assistant Grade- II (S&P)

Shri Kanchan Singh Negi

Senior Stenographer

Shri Pukhraj (Hindi)
Shri Ashok Kumar
Ms. Sunita Arora
Ms. Inderjeet Kaur
Ms. Dolly Chaudhary

Driver

Shri Surinder Prasad

Record Keeper

Shri Harbans Singh

Daftry

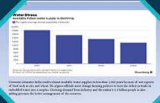
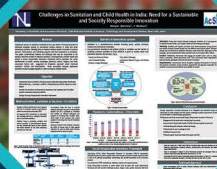
Shri Rajnath

Peon

Shri M. Kamrul

Multi Tasking staff

Shri Mohit



Contact

Director

CSIR-National Institute of Science, Technology and Development Studies,
Pusa Gate, Dr. K.S. Krishnan Marg, New Delhi- II0012

Tel.: (+91-11) 25843227, 25846064

E-mail: director@nistads.res.in

Fax: (+91-11) 25846640

website: <http://nistads.res.in>