

Review of the activities of Indian Statistical Institute for the year 2017-2018

The Indian Statistical Institute, Kolkata was established on 17th December, 1931 and was registered as a non-profit learned society under the Societies Registration Act (XXI of 1860) on 28th April, 1932 and subsequently came under the purview of the West Bengal Societies Registration Act (XXVI of 1961) which was amended in 1964. The Institute was recognised as an “Institution of National Importance” by “The Indian Statistical Institute Act, 1959, No.57 of 1959” of the Parliament on 24th December, 1959. The “Indian Statistical Institute (Amendment) Act, No.38 of 1995” of the Parliament, empowered The Institute to award degrees/diplomas in Statistics, Mathematic, Quantitative Economics, Computer Science and such other subject related to statistics as may be determined by the Institute from time to time. The Institute is engaged in an integrated programme of research, training and practical application of statistics and interdisciplinary studies through several projects in close collaboration with the Govt. of India, national and international organisations, maintaining a very high standard as a centre of excellence which has resulted in its earning several national/international recognitions over the years.

2. The objectives of the Institute are:

(i) to promote the study and dissemination of knowledge of statistics, to develop statistical theory and methods, and their use in research and practical applications generally with special reference to problems of planning of national development and social welfare.

(ii) to undertake research in various fields of natural and social sciences, with a view to the mutual development of statistics and these sciences.

(iii) to provide for and undertake the collection of information, investigations, projects and operational research for purposes of planning and the improvement of efficiency of management and production.

(iv) to undertake any other ancillary activities in fulfillment of the objectives (i), (ii) and (iii) above.

3. The Institute has its Headquarters in Kolkata with four other centres at Delhi, Bangalore, Chennai and the North-East centre at Tezpur, Assam. The Institute has also a branch at Giridih and network of service units of Statistical Quality Control and Operations Research Division across the country at Mumbai, Coimbatore, Pune and Hyderabad.

4. As envisaged in the “Indian Statistical Institute Act, 1959, No. 57 of 1959”, the Institute is fully funded by the Government of India. The major amount of internal receipts comes from the application fee for admissions, realisation from staff on account of licence fee, share of overhead charges from externally funded projects, fees from consultancy rendered by the faculties of the Institute.

5. The accounts of the Institute for 2017 - 2018 has been audited by M/s. S.K. Mallick & Co. Chartered Accountants, Kolkata who were appointed by the Institute for the purpose after their selection by the Govt. of India in consultation with the Controller & Auditor General, India and the Institute, as per provision contained in Section 6(1) of the “Indian Statistical Institute Act, 1959, No. 57 of 1959”.

6. The programme of work in a particular year, the financial estimates thereof and quantum of grants to be given by the Ministry of Statistics and Programme Implementation for the purpose, are decided in the light of the recommendations of a committee set up by the Ministry of Statistics and Programme Implementation under Section 8(1) of the “Indian Statistical Institute Act, 1959, No. 57 of 1959”. The composition of the committee includes distinguished economists and scientists as well as representatives from the Govt. of India, namely the Ministry of Statistics & Programme Implementation and Ministry of Finance. The programme of work and the expenditure estimates/grants for 2017-2018 were accordingly worked out on the basis of the recommendations of the aforesaid committee. During the year 2017-2018, the Committee recommended Rs.25284.98 lakhs under salary head Rs.18182.74 lakhs under ‘Creation of Assets’ head and Rs.6336.35 lakhs under General Head (BE). The Government approved a sum of Rs.20398.00 lakhs, Rs.4867.00 lakhs and Rs.2950.00 lakhs for salary, capital and general expenditure respectively. At the revised estimate stage, the Institute sought for a grant of Rs.23067.00 lakhs, Rs.6667.00 lakhs and Rs.4095.00 lakhs under salary, capital and general respectively, which was also recommended by the Section 8(1) Committee. The Government sanctioned a grant equal to that of the BE level under salary, capital & general heads. The revenue expenditure was more by Rs.954.75 lakhs from the fund allotted by the Ministry and Miscellaneous receipt. Capital Expenditure was Rs.1303.69 Lakhs less than the fund allotted.

7. During the year, the Institute continued to conduct its regular and professional courses for students leading to award degrees in B. Stat. (Hons.), B. Math. (Hons.), M. Stat., M. Math., Master of Science (M.S.) in Quantitative Economics, Master of Science (M.S.) in Quality Management Science, Master of Science (M.S.) in Library and Information Science, M. Tech. in Computer Science, M. Tech. in Quality, Reliability and Operations Research, Post Graduate Diploma in Statistical Methods and Analytics, Post Graduate Diploma in Computer Applications, Post Graduate Diploma in Business Analytics, Research Fellowships in Statistics, Mathematics, Quantitative Economics, Computer Science, Quality, Reliability and Operations Research, Physics, Agricultural Chemistry & Soil Science, Geology, Library and Information Science, Linguistics, Sociology and Psychology.

8. The Institute runs the International Statistical Education Centre (ISEC), an Associate Institute in Kolkata, under the auspices of the UNESCO and the Government of India. The centre provides training in theoretical and applied statistics at various levels to selected participants from the countries in the Middle-East, South and South-East Asia, the Far-East and the Commonwealth countries in Africa. Major training programme of the centre is a 10-month regular course in Statistics leading to Diploma in Statistical Training. In addition, special courses of varying duration were also organized. During the year, ISEC successfully completed its training program of 71st Term batch of the Regular Courses with 25 trainees from eleven different countries like Bhutan, Cambodia, Fiji, Mongolia, Myanmar, Nepal, Niger, South Africa, South Sudan, Sri Lanka, Tanzania and awarded Diploma in Statistical Training.

9. R.C. Bose Centre for Cryptology and Security is a new centre of the Indian Statistical Institute at Kolkata. It aims to promote interdisciplinary research in Mathematics, Computer Science and Statistics towards furtherance of teaching, research as well as training and development in Cryptology and Cyber Security. The Centre acts as a hub for all cryptographic requirements, cutting-edge research activities and technology development in relevant fields, in order to create a critical mass of researchers and experts to fulfil the

growing demand in the national and international arena. As in previous years, in 2017-18 the Centre has provided direction and advice to various wings of Armed Forces, DRDO, Police Organisations and Security Agencies. A new certificate course in Cryptology and Data Security has been started this year specially designed for defence personnel. A total of 13 officers from various defence services are enrolled in this year's course. Many externally funded projects funded by Samsung, NottApp Inc., Cisco Systems Inc. etc. were also carried out this year. As part of capacity building at the national level, the Centre has provided dedicated research internship program in Cryptology and Security to senior undergraduate and fresh post-graduate students from premier institutions of the country.

10. The Associate Institute, "Center for Soft Computing Research: A National Facility", which was established in 2005 is primarily funded by the Department of Science and Technology, Govt. of India under its IRHPA (Intensification of Research in High Priority Areas) scheme. The Center is aimed at conducting research both theoretical and applied, of international standard, in the fields of soft computing.

11. The Annual Report for the year 2017 - 2018 indicates the details of research work carried out by the Institute during the year in Theoretical Statistics and Mathematics Division; Applied Statistics Division; Computer and Communication Sciences Division; Physics and Earth Sciences Division; Biological Sciences Division; Social Sciences Division; Statistical Quality Control & Operations Research (SQC & OR) Division; and Library, Documentation & Information Sciences Division. The composition of each Division is given below:

Theoretical Statistics and Mathematics Division: Stat-Math Unit at Kolkata, Delhi, Bangalore and Chennai.

Applied Statistics Division: Applied Statistics Unit at Kolkata and Chennai, Interdisciplinary Statistical Research Unit at Kolkata. Applied and Official Statistics Unit at North-East Centre, Tezpur.

Computer and Communication Sciences Division: Advanced Computing & Microelectronics Unit, Computer Vision & Pattern Recognition Unit, Electronics & Communication Sciences Unit, Machine Intelligence Unit, Cryptology and Security Research Unit at Kolkata, Documentation Research and Training Centre, Systems Science & Informatics Unit at Bangalore and Computer Science Unit at Chennai.

Physics & Earth Sciences Division: Geological Studies Unit and Physics & Applied Mathematics Unit at Kolkata.

Biological Sciences Division: Agricultural & Ecological Research Unit, Biological Anthropology Unit and Human Genetics Unit at Kolkata.

Social Sciences Division: Economic Research Unit, Linguistic Research Unit, Population Studies Unit, Psychology Research Unit, Sampling & Official Statistics Unit at Kolkata, Sociological Research Unit at Kolkata and Giridih, Economic Analysis Unit at Bangalore and Economics Planning Unit at Delhi.

Statistical Quality Control & Operations Research (SQC & OR) Division: Bangalore, Chennai, Coimbatore, Delhi, Hyderabad, Kolkata, Mumbai, Pune and a Central SQC (CSQC) Office at Kolkata.

Library, Documentation & Information Sciences Division: Central Library at Kolkata, Chennai, Delhi, Bangalore and Tezpur.

There is also a Computer and Statistical Services Centre (CSSC), which manages the central computing facilities of ISI, Kolkata. Throughout the year, the IT infrastructures of the Institute have been upgraded by the CSSC. The outlying Centres (Delhi, Chennai, Tezpur and Bengaluru) and the Giridhi Unit of the Institute are connected with Site-to-Site VPN (Virtual Private Network). The IT infrastructures of the Institute including server's virtualization (cloud), software [VMware (esxi and VCenter), Matlab, Mathematica, ArcGis, R, etc.], Network (wired and wifi), Network and Internet security, IP Telephones, Video conferencing facility, e-library and internet facilities (NKN - 1 gbps) were managed by the CSSC and used by all the Centers of the Institute as a LAN. The classes (M. Tech. in Computer Science and PGDSMA of ISI Tezpur) through video conferencing facilities were organized by the CSSC throughout the year. The Server of the accounting package FACT installed in ISI Kolkata was accessed from all outlying Centers and Units through the Site-to-Site VPN connections for maintaining the central accounts system of the Institute. The CSSC also arranged to provide technical support to the Institute by Computer Trainees trained by the CSSC. Members of CSSC took part in teaching different courses of the Institute and also supervised project work of non-ISI students studying MCA, B. Tech., etc.

12. Externally Funded Project

Apart from theoretical and experimental plan research, the Institute undertook a variety of about one hundred and thirteen externally funded projects from different Government and non-Government organizations like European Commission; Indo-French Centre for the Promotion of Advanced Research; German Ministry of Education; Indo-Taiwan Joint Research Programme in Science & Technology; Advanced Systems Lab Hyderabad, DRDO; BARC, Dept. of Atomic Energy; Ministry of Defence; Board of Research in Nuclear Sciences; Dept. of Biotechnology; Dept. Science & Technology; DGCI&S, Ministry of Commerce and Industry; ISRO-Chandrayaan; Controllorate of Naval Arm Inspection (W); Ministry of Tourism; Board of Practical Training (ER), Ministry of HRD; Ministry of Electronics and Information Technology (Visveswaraya Scheme); Airport Authority of India; Reserve Bank of India; National Highways Authority of India; Ministry of Statistics & Programme Implementation; Ministry of Tribal Affairs; Ordnance Factory Board, Ministry of Defence; Centre for Artificial Intelligence and Robotics, DRDO; Metro Railway, Kolkata; HAL Management Academy, Bangalore; University Grants Commission; ICSSR; of Govt. of India, Dept. of Science & Technology, Govt. of West Bengal; IISc, Bangalore; Karnataka Government; Samsung Electronics, Korea; NetApp Inc. USA; Microsoft Research India; Hitachi India Limited, Bangalore; IBM, USA; Cisco Systems Inc; FAPESP, Brazil; Environment for Development (EfD) Initiative; Toyota Industries-Engine India Pvt. Ltd; Du, Dubai; Tata Consultancy Services; FIAT Ltd., Pune; Mother Dairy Fruits & Vegetables, Delhi; UltraTech Cement, Gulbarga, Tata Steel, Jamshedpur; Gujarat Cement Works, Amreli, Gujarat; Asian Paints Ltd; Balasore Alloys Ltd., Orissa; ITC Ltd; Hewlett Packard; Airbus India; TITAN Company Limited (Jewellery Division); Brakes India; Global Nonoven, Igatpuri; Grasim Industries, Bharuch; Biological E Limited, Hyderabad; etc.

13. Seminars, Workshops, Conferences, Symposiums etc. organized

During the year, the Institute organized several seminars, workshops, conferences, symposiums with the participation of leading academicians/scientists from India and abroad. A few of them are highlighted below:

- 2nd International Workshop on “*Pattern Analysis and Applications*”: Computer Vision and Pattern Recognition Unit, Kolkata, January 29-31, 2018.
- 7th International Conference on “*Pattern Recognition and Machine Intelligence (PReMI'17)*”: Machine Intelligence Unit, Kolkata, December, 05-08, 2017.
- 9th International Conference on “*Advances in Pattern Recognition, 2017 (ICAPR-2017)*”: Electronics and Communication Sciences Unit; Systems Science and Informatics Unit and R.C. Bose Centre for Cryptology and Security, held at Bangalore Centre, ISI, December 27-30, 2017.
- International Conference on “*Condensed Matter Physics*”: Physics and Applied Mathematics Unit, Kolkata, November 14–16, 2017.
- 5th International Conference on “*India Biodiversity Meet-2018*”: Agricultural and Ecological Research Unit, Kolkata, March 15-17, 2018.
- International Symposium on “*Operations Research and Game Theory: Modeling and Computation*”: Statistical Quality Control and Operations Research Unit, New Delhi, January 09-11, 2018.
- National Conference on “*Land, Labour and Livelihood: Focus on Development of Marginalized Communities and Social Groups*”: Sociological Research Unit, Giridih, January 30-31, 2018.
- National Conference on “*Population and Development in Eastern and North-Eastern Regions of India*”, Population Studies Unit, Kolkata in collaboration with Indian Association for Study of Population (IASP), September 14-15, 2017.
- National Symposium on “*Agricultural research under a changing climate in Eastern India*”: Agricultural and Ecological Research Unit, Giridih, January 17-18, 2018.
- National Conference on “*Frontiers of Statistical Physics*” Physics and Applied Mathematics Unit, Kolkata, in collaboration with Presidency University, Kolkata, February 26–28, 2018.
- National Symposium on “*Applications of Mathematics and Statistics on Biological and Physical Systems*”: Agricultural and Ecological Research Unit, Kolkata, December 12, 2017.
- Training Programme on “*Recent Developments in International Statistical Systems*” (for ISS Officers): Sampling and Official Statistics Unit, Kolkata in addition to Overseas Learning Component at Statistics Netherlands, March 19-23, 2018.

- Workshop on “*Public Economic*”: Economics and Planning Unit, Delhi, in collaboration with Delhi School of Economics, March 20-21, 2018.
- 13th Annual Conference on “*Economic Growth and Development*”: Economics and Planning Unit, Delhi, December 18-20, 2017.
- Workshop on “*Scientific Framework for National Transformation*”: Statistical Quality Control and Operations Research Unit, Kolkata, January 16–18, 2018.
- Workshop on “*Advances in Authenticated Encryption*”: Cryptology and Security Research Unit, Kolkata, in collaboration with National Mathematics Initiative, India September 19-22, 2017.
- Training Program on “*Advanced Data Analysis*”, Statistical Quality Control and Operations Research Unit, Bangalore, held at ICFAI University, Agartala, Tripura, November 28-30, 2017.
- Workshop on “*Knowledge Management and the Role of Libraries*”: Library Unit, North-East Centre, Tezpur, October 31, 2017.
- Training Programme on “*Statistical Techniques for Business Forecasting*”: Statistical Quality Control and Operations Research Unit, Mumbai, July 13-15, 2017.

14. Publication of the Institute

The internationally renowned journal *Sankhyā*, an official publication of the Indian Statistical Institute, was founded by Professor P.C. Mahalanobis in 1932 and began publication under his editorship. It is devoted to original research articles in Probability, Mathematical Statistics and Applied Statistics. Reviews and discussion articles on current research activity in the above areas are also published. A rigorous peer review process is followed for acceptance of articles submitted for publication in *Sankhyā*. Many seminal articles in Probability, Theoretical Statistics and Applied Statistics have appeared in *Sankhyā*. The journal is published in two separate series – Series A and Series B. Series A with two issues per year, one in February and the other in August, covers Probability and Theoretical Statistics, while Series B with two issues per year, one in May and the other in November, covers Applied and Interdisciplinary Statistics. Beginning 2010, the Institute has been collaborating with Springer for printing and marketing the international edition of *Sankhyā*, in both prints and electronic editions. The editorial system is now completely electronic, that is, the entire process starting from submission of articles to editorial processing ending in final editorial decision for articles is now done online. The free access to the articles of every editions of *Sankhyā* is available through the *Sankhyā* website (sankhya.isical.ac.in).

15. Scientific Papers and Publications

During the year, about 562 scientific papers were published in different journals of national and international repute.

16. Scientific Assignments Abroad

Seventy-six Scientists of the Institute visited a number of foreign countries either on invitation or under cultural exchange programme for attending international seminars and conferences. Most of them presented scientific papers and delivered lectures in those seminars and conferences. Countries visited by ISI faculty members were Austria, Australia, Bangladesh, Belgium, Berlin, Brazil, Chile, China, Czech Republic, Dubai, Estonia, Ethiopia, France, Germany, Greece, Israel, Italy, Japan, Morocco, Malaysia, Mexico, Norway, Nepal, Poland, Portugal, Russia, Republic of Korea, Sri Lanka, South Korea, South Africa, Slovenia, Spain, Switzerland, Singapore, Thailand, Taiwan, Tunisia, the Netherlands, UK, USA, Uzbekistan, Vietnam and a few others.

17. Visiting Scientists

Two hundred and seventy five scientists from, Australia, Bangladesh, Belgium, Brazil, Czech Republic, China, France, Germany, Hungary, Israel, Italy, Japan, Malaysia, New Zealand, Netherlands, Nigeria, Oman, Poland, Russia, Saudi Arab, Switzerland, Singapore, Sweden, South Africa, Slovenia, Taiwan, Turkey, USA, UK and India visited the Institute to attend various Workshops, Conferences, Seminars etc. and also to participate in collaborative research, teaching and other scientific activities of the Institute.

18. Recognition to ISI Scientists

In appreciation and recognition to the high standard of research and scientific excellence maintained by the researchers of the Institute, several faculty members received laurels in the forms of Awards, Fellowships from Government of India and organizations/bodies/universities of national and international repute like IEEE, INSA, DST, INFOSYS Prize, ICTP etc. Several faculty members served as Visiting Scientist, Honorary Professor, Visiting Professors in various universities in US and Europe; Indian Council of Social Sciences Research (ICSSR); Indian National Science Academy etc. Besides, many faculty members were invited by national and international Institute/bodies to act as chairman, members, chief editors, editors in committees/editorial boards etc. Among those, some of the most notable recognitions earned by the faculty members during the year 2017-2018 are indicated below: -

- N. Gupta has been awarded B.M. Birla Science Prize in Mathematics, 2017.
- R. Munshi has been selected Fellow of the Indian Academy of Sciences, 2017 and awarded Infosys Prize in Mathematical Sciences, 2017;
- D. Yogeshwaran has been awarded INSA Young Scientist Award by the Indian National Science Academy (INSA), 2017 and IISA Young Scientist Award, 2017.
- S. Bandyopadhyay has been awarded National Leadership Award in Science and Technology (Young), by Lakshmi Pat Singhania-IIM Lucknow, 2017; Distinguished Alumnus Award by the IIT, Kharagpur, 2017; Infosys Prize for Engineering and Computer Science, 2017 and J.C. Bose Fellowship, Engineering Sciences by the DST, Govt. of India, 2017-22.
- R.K. De has been awarded Fulbright-Nehru Academic and Professional Excellence Fellowship (Flex Award), 2016- 2018.

- A. Mukhopadhyay has been selected as the Honorary Associate Researcher, Centre for Science and Humanities, CNRS (France).
- S Mitra has been awarded Fulbright-Nehru Academic and Professional Excellence Fellowship (Flex Award), 2018- 2019.
- D. Dutta Roy has been awarded Innovative Scientist Award by the Indian Academy of Health Psychology, 2017.
- D. Mishra has been awarded Mahalanobis Memorial Award by the Indian Econometric Society, 2018.
- A. Ghosh has been awarded Bose-Nandi Young Statistician Award (1st Place) by the Calcutta Statistical Association (CSA), 2017
- U. Bhattacharya has been awarded Best Paper Award in 7th International Conference on Soft Computing for Problem Solving, 2017 and also Best Paper Award, 3rd International Conference on Next Generation Computing Technologies, 2017.
- H.C. Behara has been selected as the Fellow, Royal Asiatic Society of Ireland & Great Britain, 2017 and also selected as the Fellow, Royal Anthropological Institute, London, 2017.
- S.K. Pal has been selected as the IEEE Tencent Rhino-Bird International Expert, 2017.
- S. Pal has been selected for Research Alumni Strategy Grant, University of Bonn, Germany, 2018.
- M. Swaminathan has been appointed the Non-Official Director, Board of Nationalised Bank, Union Bank of India.
- D.P. Mukherjee has been selected the Fellow of the West Bengal Academy of Science and Technology, 2017.
- K. Das has been selected Associate Fellow by the West Bengal Academy of Science and Technology, 2018.
- V.K. Ramachandran has been appointed Vice Chairman by the Kerala State Planning Board, Trivandrum.
