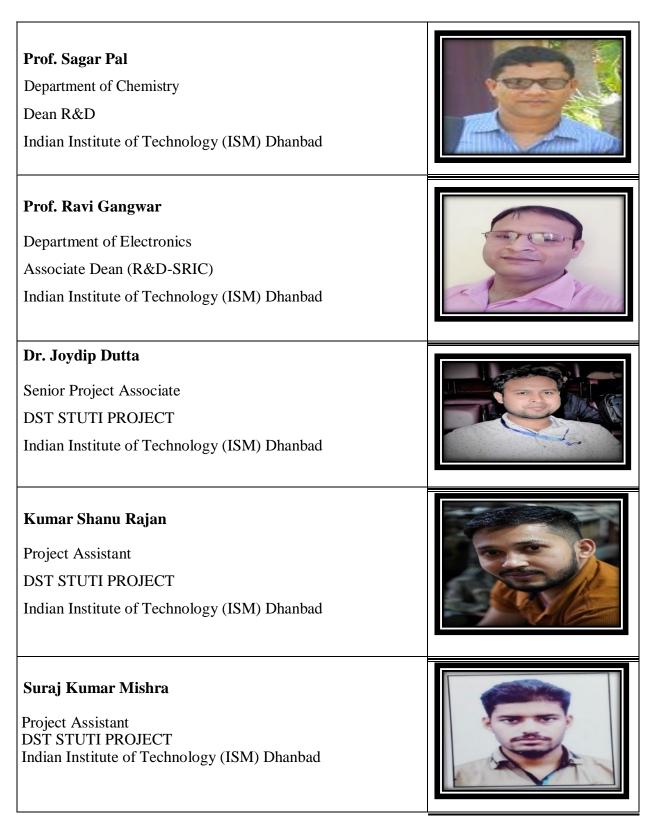
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DST-STUTI TRAINING PROGRAMME IIT (ISM), DHANBAD - 2023 STUTI Coordinator-PMU



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Program Coordinator

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Advisory Committee

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Coordinator (R&D-SRIC) Indian Institute of Technology (ISM) Dhanbad

Prof. Sanjit Kumar Pal

Associate Professor & Head Department of Applied Geophysics Indian Institute of Technology (ISM) Dhanbad

Prof. G Srinivasa Rao

Assistant Professor Department of Applied Geophysics Indian Institute of Technology (ISM) Dhanbad

Prof. Niptika Jana

Visiting Faculty Department of Applied Geophysics Indian Institute of Technology (ISM) Dhanbad











INAUGURAL PROGRAMME SCHEDULE

VENUE : EDC, IIT (ISM) Dhanbad

TIME	PROGRAMME
09:00 AM-09:30 AM	REGISTRATION
09:30 AM-09:40 AM	Inviting The Guests To The Dais
	(Director, Dean R&D, Associate Dean, HOD Applied
	Geophysics, Programme Coordinators)
09:40 AM-09:50 AM	Welcome Address By
	Prof. Arun Singh
	PROGRAM COORDINATOR
09:50 AM-10:00 AM	Address by Prof. Rajiv Shekhar
	The Hon'ble director,
	Indian Institute of Technology (ISM) Dhanbad
10:00 AM-10:10 AM	Address by Prof. Sagar Pal Dean, R& D & PMU Coordinator Indian Institute of Technology (ISM) Dhanbad
10: 10 AM- 10:15 AM	Address by Prof. Ravi Gangwar Associate Dean (R&D-SRIC) Indian Institute of Technology (ISM) Dhanbad
10:15 AM-10:20 AM	Address by Prof. Sanjit Kumar Pal HOD, Department of Geophysics Indian Institute of Technology (ISM) Dhanbad
10:20 AM –10:30 AM	VOTE OF THANKS Prof. Arun Singh
10:30 AM	HIGH TEA



The Indian Institute of Technology (ISM), Dhanbad constituted under the Institute of Technology Act, 1961 is administered through the IIT Council the apex body of the Government of India under the Chairmanship the of Honorable Ministers, MoE for uniform and smooth governance of Pan-IIT in the country. The vision and mission of the institute are to be a nationally and internationally acclaimed premier institution of higher technical and scientific education with social commitment having an ethos for intellectual excellence, where initiative is nurtured, where new ideas, research, and scholarship flourish, wand here intellectual honesty is the norm and form, which will emerge the leaders and innovators of tomorrow in the realm of technology. Situated in the heart of the country's prime coking coal belt, 260 km from Kolkata with a campus spread over an area of 393 acres (with 218 acres of existing campus and 175 acres under acquisition and development), the fully residential IIT(ISM) has all the facilities of world class academic institute. What started as an institution to impart mining education has graduated into a full-fledged technical institution of international acclaim offering a host of programs like B.Tech. M.Tech. M.Sc., MBA, and PhD. The current NIRF ranking of the institution among all the engineering colleges is 11.



Department of Applied Geophysics, IIT(ISM) Dhanbad

The Department of Applied Geophysics of the Indian Institute of Technology (Indian School of Mines) Dhanbad was established in 1957. Since then, the department has been leading the way for excellence in earth science education and is a front liner in the field of mineral exploration, and underground mines. Equipped with assorted geophysical instruments with the support of UGC SAP/CAS, DST-FIST, the department has been successfully carrying out several geophysical studies and seismic hazard mapping across the underground coal mines to delineate the mine induced sub-surface cavities and waterlogged areas in inaccessible old workings. Seismic hazard maps of several areas have been constructed using sophisticated/novel modeling/inversion techniques to complement or improve the existing building codes.

The faculty strength of the department is 13 covering specialization in the entire range of geophysical approaches however, the main thrust area is exploration geophysics. The department has a very strong alumni base who have served or presently are in very senior positions in various private and government organizations, PSUs, and academic institutions both in India and abroad.



DST-STUTI TRAINING PROGRAMME IIT (ISM), DHANBAD - 2023 SYNERGISTIC TRAINING PROGRAMME UTILIZING THE SCIENTIFIC AND TECHNOLOGICAL INFRASTRUCTURE (STUTI)

Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI) Program of The Department of Science & Technology (DST), Government of India, is Intended to build human resources and knowledge through open access to S & T Infrastructure Across the Country by organizing specialized training programs on DST-supported R&D equipment targeting Ph.D. scholars, post-doctoral fellows, scientists, faculty, etc. are actively involved in intensive research.

As a complement to the various schemes of DST funding for the expansion of R&D Infrastructure at academic institutions, the STUTI scheme envisions a hands-on training program and sensitization of the state-of-the-art equipment as well as towards sharing while ensuring transparent access of S&T facilities.

The training will be conducted on a hub-and-spoke model approach. The Department of Science and Technology as the apex body will identify an Institute that shall function as a Project Management Unit (PMU). The hubs will essentially be Organizations having availed projects under FIST/ PURSE/ CURIE/ SAIF/ SATHI schemes. The PMU then shall act as a hub to further identify host institutes/ departments in the catchment areas for coordinating and imparting the training smoothly and efficiently.

The program is being organized as part of Azadi ka Amrit Mahotsav. The program consists of both theory and hands-on experience with various instruments, supported by DST. The uniqueness of the program includes a minimum of four hours of theory and the remaining 50% of the duration is on practical training on the equipment efforts would be made for hands-on use of equipment for demonstration/ characterization by each participant. The program aims to promote research collaborations to the maximum extent. After completion of the workshop, participants can appreciate how these techniques will help in understanding social problems through knowledge and information gained from this program. This training program provides a platform for interaction and exchange of innovative ideas on current trends in the fields of Science and Technology, with talks by eminent people in the field.

DEPARTMENT OF SCIENCE AND TECHNOLOGYMINISTRY OF SCIENCE AND TECHNOLOGY GOVT. OF INDIA



The Department of Science & Technology (DST) was established in May 1971, to promote new areas of Science & Technology (S&T) and to play the role of a nodal department for organizing, coordinating, and promoting S&T activities in the country. The Department has major responsibilities for specific projects and programs such as the Formulation of policies relating to Science and Technology, Matters relating to the Scientific Advisory Committee of the Cabinet (SACC), etc.

The R&D Infrastructure Division of the Department aims to strengthen the S&T infrastructure of the country by fostering well-equipped R&D labs in theacademic/research institutes/universities as well as a strong culture of research collaboration between institutions and across disciplines.



STUTI HANDS-ON TRAINING WORKSHOP SCHEDULE 23rd - 29th JANUARAY

Date	Lecture 1	Lecture 2	Practical
	09:30-11:00 AM	11:15-12:45 PM	02:00-05:00 PM

DST-STUTI TRAINING PROGRAMME IIT (ISM), DHANBAD - 2023				
23.01.23	Introduction to near-	Application of near-	Demonstration of Syscal Elrec	
	surfaceGeophysics	surfaceGeophysics	Pro with TIPIXtransmitter	
	(Prof. S. P. Sharma)	(Prof. S. P. Sharma)	(Prof. S. K. Pal)	
24.01.23	Introduction to Electrical	Applications of Electrical	Demonstration of SYSCAL	
	Resistivity Tomography	Resistivity Tomography	Junior Switch-96	
	(Prof. M. Israil)	(Prof. S. K. Pal)	(Prof. Arun Singh)	
25.01.23	Fundamentals of	Fundamentals of Gravity	Demonstration of CG-6 Land	
	Gravity & Gradiometry:	& Gradiometry: Data-	autograv gravity meter	
	Data-acquisition,	acquisition,processing &	(Prof. U. K. Singh)	
	processing &	interpretations.		
	interpretations.	(Prof. U. K. Singh)		
	(Prof. U. K. Singh)			
26.01.23	Applications of the	Applications of the Active	Demonstration of Geode	
	PassiveSeismic in near-	Seismic in near-surface	Seismograph and GeoTiny	
	surface investigations	investigations	(Prof. S. D. Gupta/ Prof.	
	(Prof. Uma Shankar)	(Prof. S. D. Gupta)	Niptika Jana)	
27.01.23	Audio Magnetotelluric	Audio Magnetotelluric	Demonstration of Phoenix	
	Method: Theory to field	Method: Theory to field	EM system	
	Applications	Applications	(Prof. Arun Singh)	
	(Prof. Arun Singh)	(Prof. Arun Singh)		
28.01.23	Fundamentals of	Data acquisition and	Demonstration of GSSI	
	Ground	processing using Ground	TerraSIRch SIR System-3000	
	penetrating Radar	Penetrating Radar	(Prof. S. D. Gupta/ Prof.	
	(Prof. K. K. K. Singh)	(Prof. S. D. Gupta)	Niptika Jana)	
29.01.23	Inverse theory &	Inverse theory & AI/ML in	AI/ML using Python	
	AI/ML in	Geophysics	(Prof. Saumen Maiti / Prof.	
	Geophysics (Prof.	(Prof. Saumen Maiti)	G. S. Rao)	
	Saumen Maiti)			

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Staff Members

Designation	Name
Technical Officer	Mr. Rajkumar
Technical Assistant	Mr. Amit Kumar

HIGHLIGHTS OF THE PROGRAMME

- The seven days STUTI training program enabled the participants to acquire skill-based knowledge and hands-on training into the sophisticated geophysical instruments such as TIPIX transmitter, SYSCAL Junior Switch-96, CG-6 Land autograv gravity meter, Geode Seismograph and GeoTiny, Phoenix EM system, GSSI TerraSIRch SIR System-3000, AI/ML using python, etc.
- Elaborate descriptions on the working principle of the sophisticated instruments, data acquisition, processing, and interpretation were presented to the participants.
- Different aspects of data interpretations such as inversion were discussed along with applications of AI/ML in geosciences.
- Participants were also briefed and demonstrated about the laboratory safety, instrument safety and precautions to be taken during running of the sophisticated instruments.

PARTICIPATING INSTITUTES STATE WISE

SI. No.			No. of Registered Participants
		IIT(ISM), Dhanbad	04
1.	Jharkhand	Ranchi University	01
		Koylanchal University	01
		CSIR-CIMFR Dhanbad	01
2.	West Bengal	IIT Kharagpur	04
3.	Maharashtra	IIT Bombay	02
		IISER Pune	01
4.	Telangana	University of Hyderabad	01
5.	Uttar	BHU Varanasi	02
	Pradesh	IIT Kanpur	02
4.	Gujarat	Institute of Seismological Research, Gandhinagar	03
5.	Assam	IIT Guwahati	01
6.	Puducherry	Department of Earth Sciences, Pondicherry University, Puducherry	01
7.	Andhra Pradesh	Centre for Earth, Ocean and Atmospheric Sciences, University of Hyderabad	01
		Department of Geophysics (Andhra University)	01
8.	Haryana	Department of Geophysics(Kurukshetra University)	02
9.	Kerala	CUSAT, Cochin	01
		Geonyms India Private Limited	01
		TOTAL	30

DST-STUTI TRAINING PROGRAMME IIT (ISM), DHANBAD - 2023 List of Registered Participants

SI No.	Name	Affiliation	State	Designation
01	Ms. Susmita Goswami	Indian Institute of Technology Kharagpur	West Bengal	Research Scholar
02	Ms. Shweta Pandey	Indian Institute of Technology Kanpur	Uttar Pradesh	Research Scholar
03	Ms. Mita Uthaman	Indian Institute of Technology Kharagpur	West Bengal	Research Scholar
04	Ms. Arpita Panda	Centre for Earth, Ocean and Atmospheric Sciences, University of Hyderabad	Andhra Pradesh	Research Scholar
05	Ms. Abhirami R	CUSAT, Cochin	Kerala	Research Scholar
06	Ananaya P. Mukherjee	Indian Institute of Technology Kharagpur	West Bengal	Research Scholar
07	Mr. Prahladh Kindangi	Department of Geophysics (Andhra University)	Andhra Pradesh	Assistant Professor
08	Dr. Rama Chandrudu Arasada	IIT (ISM) Dhanbad	Jharkhand	Research Scholar
09	Mr. Surajit Kumar Das	IIT (ISM) Dhanbad	Jharkhand	Research Scholar
10	Iktesh Chauchan	Earth and climate science(IISER Pune)	Maharashtra	Research Scholar
11	Akhilesh Kumar	Department of Earth Sciences, IIT Kanpur	Uttar Pradesh	Research Scholar
12	Vishnu Kant Sharma	Department of Earth Sciences, IIT Kanpur.	Uttar Pradesh	Research Scholar
13	Gilbert M. George	Department of Earth Sciences, IIT Bombay	Maharashtra	Research Scholar

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14	Santosh Kumar	IIT (ISM) Dhanbad	Jharkhand	Research Scholar
15	Sooraj A.	CUSAT, Cochin	Kerala	Research Scholar
16	Suraj Kumar Pal	Department of Geophysics BHU Varanasi	Uttar Pradesh	Research Scholar
17	Ravi Kant	Department of Geophysics BHU Varanasi	Uttar Pradesh	Research Scholar
18	A.S.S. Rajkumar	Institute of Seismological Research, Gandhinagar (Gujarat).	Gujarat	Research Scholar
19	Mr. Shirish Bose	Department of Geology and Geophysics (IIT Kharagpur)	West Bengal	Research Scholar
20	Amit Kumar	University Department of Geology, Ranchi University	Jharkhand	Assistant Professor
21	Krishna Gopal	B.B.M.K.U Dhanbad	Jharkhand	Assistant Professor
22	Arnab Pal	Department of Civil Engineering (IIT Guwahati)	Assam	Research Scholar
23	Mr. Aakash Deep	Department of Geophysics (Kurukshetra University)	Haryana	Research Scholar
24	Dr. Peush Chaudhary	Institute of Seismological Research	Gujarat	Scientist

25	Ajayan V.O.	Geonyms India Private Limited	Kerala	Engineering Geologist
26	Rakesh Nikam	Institute of Seismological Research, Gandhinagar	Gujarat	Project Scientist
27	Dr. Abhay Kumar Bharti	CSIR- CIMFR Dhanbad	Jharkhand	Scientist
28	Dr. Shailendra Singh	Department of Earth Sciences, Pondicherry University, Puducherry	Tamil Nadu	Assistant Professor
29	Amrish Saini	Department of Geophysics(Kurukshetra University)	Haryana	Research Scholar
30	Koustav Ghosal	Department of Geophysics IIT (ISM) Dhanbad	Jharkhand	Research Scholar
30	Rakesh Nikam	Institute of Seismological Research, Gandhinagar	Gujarat	Project Scientist

DAY BY DAY PROCEEDINGS

Highlights of the Day-1 (Dated: 23rd January, 2023)

The first session of the training program started with a lecture by Prof. S.P Sharma, Dept. of Geology and Geophysics, IIT Kharagpur. Two lectures given based on Introduction & Application of near-surface Geophysics (From 10:45 PM to 1:30 PM).

Next, after the lunch break, a practical demonstration (from 02:00 PM to 05:00 PM) on Syscal Pro with a TIPIX transmitter was provided by Prof. Sanjit K. Pal, IIT (ISM) Dhanbad.



Prof. S.P Sharma delivering a lecture on Introduction & Application of near-surface Geophysics.

Highlights of the Day-2 (Dated: 23rd January, 2023)

On the second day, two lectures were given on Introduction to Electrical Resistivity Tomography & Application of Electrical Resistivity. The first lecture was given by Prof. M. Israil, Dept. of Earth Sciences, IIT Roorkee on Introduction to Electrical Resistivity Tomography and the second lecture was given by Prof. S. K. Pal on Application of Electrical Resistivity.

Next, after the lunch break, a practical demonstration (from 02:00 PM to 05:00 PM) on SYSCAL Junior Switch -96 was provided by Prof. Arun Singh. The array setup, file configuration for the instrument, various parameters for data acquisition and data dumping was demonstrated.



Prof. M. Israil delivering lecture on Introduction to Electrical Resistivity Tomography



Prof. Sanjit Kumar Pal delivering lecture on Introduction to the Application of Electrical Resistivity

Highlights of the Day-3 (Dated: 23rd January, 2023)

Similarly, on the third day, two lectures were conducted on the fundamentals of Gravity & Gradiometry: Data acquisition, processing & interpretations. The lectures were delivered by Prof. U. K. Singh, Dept. of Applied Geophysics, IIT (ISM) Dhanbad. Following the lunch break, a practical demonstration (from 02:00 PM to 05:00 PM) on CG-6 Land Autograv gravity meter provided by Prof. U.K. Singh.



Prof. U.K. Singh with the participants during hands-on training on CG-6 Land Autograv gravity meter.

Highlights of the Day-4 (Dated: 23rd January, 2023)

On the fourth day, two lectures were given. The first lecture on Applications of passive seismic in near-surface investigations by Prof. Uma Shankar, BHU Varanasi and the second lecture on Application of the Active Seismic in a near-surface investigation Prof. S. D. Gupta, Dept. of Applied Geophysics, IIT (ISM) Dhanbad. After the lunch break, a practical demonstration on the 24 channel Geode Seismograph and GeoTiny was provided by Prof. S. D. Gupta and Prof. Niptika Jana.



Prof. Devi Prasad Mishra delivering a lecture on Applications of passive seismic in near-surface investigations.



Highlights of the Day-5 (Dated: 23rd January, 2023)

Similarly, on the fifth day, two lectures were delivered on Audio Magnetotelluric Method: Theory to field Applications were the prime focus was on Magnetotelluric theory, data acquisition, processing and interpretation using 2D/3D inversion techniques of these lectures. Both these lectures, from 09:30 AM to 11:00 AM from 11:15 AM to 12:45 PM were by Prof Arun Singh, Dept. of Applied Geophysics, IIT (ISM) Dhanbad.

Next, after the lunch break, a practical demonstration on the Phoenix EM system was provided by Prof. Arun Singh.



Prof. Arun Singh delivering a lecture on Audio Magnetotelluric Method: Theory to field Applications.

Highlights of the Day-6 (Dated: 23rd January, 2023)

On the sixth day, two lectures were given. The first lecture on the Fundamentals of Ground Penetrating Radar by Dr. K. K. Singh (former scientist, CSIR-CMPHIR, Dhanbad) and the second lecture on Data acquisition and processing using Ground Penetrating Radar was delivered by Prof. S. D. Gupta Dept. of Dept. of Applied Geophysics, IIT (ISM) Dhanbad.

Next, after the lunch break, a practical demonstration (from 02:00 PM to 05:00 PM) on the GSSI TerraSIRch SIR System-3000 was provided by Prof. S. D. Gupta and Prof. Niptika Jana.

Highlights of the Day-7 (Dated: 23rd January, 2023)

On the seventh day (the last day of the training programme), two lectures were conducted on Inverse theory & AI/ML in Geophysics. The lectures were delivered by Prof. Saumen Maiti, Dept. of Applied Geophysics, IIT (ISM) Dhanbad.

Next, after the lunch break, a practical demonstration on AI/ML in Geophysics using Python was provided by Prof. Saumen Maiti and Prof. G. S. Rao.



Prof. Saumen Maiti delivering a lecture on Inverse theory & AI/ML in Geophysics.

DST-STUTI TRAINING PROGRAMME IIT (ISM), DHANBAD - 2023 VALEDICTORY SESSION

Valedictory Program [29-01-2023 from 04:05 PM - 5:40 PM]		
Time (IST)	Event	
04:05 PM-04:15 PM	Address by Prof. Dheeraj Kumar	
	Deputy Director IIT(ISM), Dhanbad	
04:15 PM-04:25 PM	Address by Prof. Ejaz Ahmad	
	Coordinator (R&D-SRIC) IIT(ISM), Dhanbad	
04:25 PM-04:30 PM	Address by Prof. Sanjit Kumar Pal	
	Head, Department of Geophysics	
04:30 PM04:35 PM	Address by Prof. Anil Kumar Chaubey	
	Visiting Professor, Department of Geophysics	
04:35 PM-04:40 PM	Address by Prof. Arun Singh	
	Training Program Coordinator	
04:40 PM-05:00 PM	Feedback by Participants	
05:00 PM-05:15 PM	Certificate Distribution to participants	
05:15 PM-05:20 PM	Vote of Thanks	
05:20 PM-05:35 PM	Photo session	
05:40 PM	High Tea	

Photos



Prof. Sagar Pal addressing the participants.



Group Photo



















Prof. Dheeraj Kumar presenting the certificate to the participants.

WAY FORWARD

Based on the responses, interactions, and feedback received from the participants, it is realized that such training programs where the hand on training component is attached are highly beneficial. We are encouraged and motivated to organize such programs with further improvements in the near future.

ACKNOWLEDGEMENTS

The Department of Science and Technology (DST) New Delhi has sanctioned a project under Synergistic Training Program Utilizing the Scientific & Technological Infrastructure (STUTI) program to IIT(ISM) Dhanbad. We would like to thank DST for funding the program. A big thanks to the volunteers and the organizing team members. This training program would not have been successful without their constant and active support and we acknowledge their contributions and enthusiasm in each aspect of the event. This also motivates us to conduct more programs in the near future. Last but not least, the organizing committee wants to put on record the help and support of all administrative staff and everyone who has contributed to making this training program a grand success.

OUTCOME

These seven days unique STUTI training program received overwhelming responses from institutes/universities/colleges/industries across the country. Applicants were from different backgrounds such as Geophysics, Geology and Civil engineering. Although it was not possible to include all the applicants in the program, but reasonably a good number of participants were selected with diversification about location and background. The program enabled the participants to have a close look and acquire skill-based knowledge and hands-on training into the sophisticated analytical instruments, such as Syscal Pro with TIPIX transmitter, Junior Switch-96, CG-6 Land Autograv gravity meter, Geode seismograph and Geotiny, Phoenix EM system, etc. The participants were provided elaborate descriptions of the working principle of the sophisticated instruments, data acquisition and processing and interpretation.

Participants received expertise to gain a deeper understanding of instrumental techniques, develop data analysis and interpretation skills. Most importantly, participants received opportunities to interact with the resource persons and technical persons on individual basis. In summary, the training program provided the participants an opportunity to visit the Department of Applied Geophysics and first hand see all the important geophysical instrument used rfor near surface investigation. It is expected that the participants will also try to address social problems through knowledge and information gained from this programme.

FEEDBACK

From the feedback received from the participants, it seems that the programme was well-received by the participants. All the participants are happy and have shown their satisfaction in respect of the content, delivery, and presentation of all the topics covered during the presentation. Resource persons also conveyed positive feedback in respect of the programme. The organizing committee took special interest in the foods provided to the participants and resource persons.