

A Report

Lund, 20th April 2008.

- by
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- on a visit of Swedish Scientists to India - April 2008.
- Organised by
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- INSTEC -Centre for Indian-Swedish Cooperation on Technical Research and Education,
- KTH, Valhallavägen 79, Stockholm, SWEDEN.

Kerala - seminar, study tour and meeting with the chief minister

On 6th of April six of us proceeded to Kerala to meet the representatives of the KSCSTE- Kerala State council for Science Technology and Environment www.kscste.org and the directors of its individual institutions. The main aim of the visit was to have meetings with the president, the executive vice president of the Kerala State council for Science Technology and Environment as well as the directors of the different centres of research and development to discuss one of the main objectives if INSTEC namely “To work for the development of an Indian Institute for Sustainable Development and Environmental Technology ”



Professors Lars Öberg, of Umeå University, Lars-Christer Lundin of Uppsala University, Göran Baurne of Royal Institute of Technology, Stockholm, and Björn Karlsson LTH, Lund University at the back, with Prof Ramon Wyss of Royal Institute of Technology, Stockholm and Prof Baboo M. Nair of LTH, Lund University in the front.

We arrived at 12.30 PM and we were received at the Thiruvananthapuram airport by Dr. Prakashkumar for further transport to Mascot Hotel located at the centre of the city with a view over the skyline of the city including the state legislative assembly building. Some of us were a bit ill with fever and common cold and wanted to rest the rest of the day. I took the opportunity in the after noon to discuss the organisation of the visit and its various details with Dr. Prakashkumar before retiring for the day.

On 7th April we were picked up from the hotel for a scientific session at the conference hall of the KSCSTE at Sasthra Bhavan, Pattom. The day started with a warm floral welcome by the ladies of the council following the age old tradition of Kerala "Ethirellpu" which was deeply appreciated by all the Swedish visitors even though there was no "kottum kuravayum". After some social activity including small visit to the office of the executive vice president Dr. E. P. Yesodharan, the formal meetings were started.

The executive vice president of the KSCSTE Dr. EP Yesodharan welcomed the Swedish delegates and expressed his wish to have a fruitful discussion during the visit and valuable cooperation in the future presenting the genesis and mission of the KSCSTE which has the chief minister of the state as its president.



Then I introduced the Swedish delegates to the participants of the meeting and expressed my gratefulness to my Swedish colleagues for coming with me to Kerala and to my Kerala friends for preparing grounds for a meeting like this for discussing collaboration in research and higher education between institutions of Kerala where I was born and institutions of Sweden where I am living.

KSCSTE is an autonomous body of the government of the Kerala State dealing with policy matters related to Science and Technology of the state.

The KSCSTE- Kerala State Council for Science, Technology and Environment was constituted in November 2002 as an autonomous body to encourage and promote Science and Technology related activities in the Kerala State by restructuring the erstwhile State Committee for Science, Technology and Environment (STEC) established in 1972 in concurrence with the Science Policy of Government of India.

The apex body of KSCSTE is the State Council with Chief Minister of Kerala as the President. The chief executive officer of the Council is Executive Vice President (EVP).

The Main functions of the State Council are to:

- Plan, formulate and implement Science and Technology Promotion and other related research and development programmes.
- Provide overall guidance to the programmes and the developments of R&D centres of the Council.
- Withdraw and disburse the grant-in-aid funds from the Government and sponsoring agencies to R&D Centres and other grant-in-aid institutions.

The decisions of the State Council and Executive Committee are implemented by the Council Headquarters (CHQ) based in Thiruvananthapuram. The functions of CHQ are carried out under the overall guidance of Executive Vice President who is also the ex-officio Principal Secretary of Science & Technology Department (S&TD). The executive functions are administered by the Member Secretary. The Science and Technology programmes are managed by the Principal Scientific Officers, Scientific Officers and other staff members, both technical as well as administration.

KSCSTE also have initiatives in popularising education in science in the schools and institutions of higher learning in the state.

KSCSTE has its own R&D centres and the presentations of the technical session were done by the directors of the respective institutions. There are six R&D centres under the umbrella of the Council which does research work in specific identified domains. Presentations of the activities of the centres were done under the chairmanship of Prof. Ramon Wyss.

In an impressive presentation **Dr. M. Baba**, director of the The Centre for Earth Science Studies (www.cessind.org) talked about the genesis, vision, mission and activities of the centre which was started as a Centre of Excellence in Earth Sciences instituted by the Government of Kerala in 1978. It is an Autonomous Research Centre and it promote and establish modern scientific and technological research and development studies in earth sciences. CESS pursues multidisciplinary approach in problems related to land, sea and atmosphere, does Research & Development activities in basic and applied fields, conducts user training, academic programs, consultancy and popularisation of Science.

Dr. MD Nandeswar, Director of The Centre for Water Resources Development and Management (CWRDM) located at Kozhikode presented various the activities of his institution. CWRDM has a Research Council and a Research Committee consisting of all scientists of the Centre which assist in monitoring the progress of research works and in carrying out preliminary screening of the project proposals.

The management of the Centre is done by a Management Committee chaired by the Executive Director of CWRDM. There are 37 scientists belonging to multifarious disciplines like civil

engineering, hydrology, hydrogeology, environmental sciences, agriculture, biological and chemical sciences, social sciences etc carrying out research on ' WATER' in CWRDM. The technical staff and project staff provide support to the scientific teams. The scientific activities of the Centre are organized into seven scientific divisions, five units/central facilities and five regional centres:

Scientific Divisions

[Surface Water](#)
[Ground Water](#)
[Environmental Studies](#)
[Library, Documentation & Information Division](#)
[Water Management \(Agriculture\)](#)
[Computer Applications](#)
 Isotope geology

Units/Central Facilities

[Central Water Analysis Laboratory](#)
[Manned Observation Stations Unit](#)
[Water Resources Museum](#)
[Remote Sensing Cell](#)
[LIWAMP](#)

Dr. R. Gnanaharan presented the activities of The [Kerala Forest Research Institute \(KFRI\)](#) which was established to undertake research in areas like forestry, biodiversity etc., that are vital to the development of the Kerala State.

The KFRI main campus at Peechi is designed and constructed by the reputed architect Mr. Laury W. Baker in his unique low-cost style. It has laboratories, library and other facilities attached to various Divisions. The Divisions are well equipped to undertake researches of disciplinary and multi-disciplinary nature.

Nilambur Subcentre and Palappilly Field Research Centre have facilities for laboratory work and raising nurseries and experimental plantations. The Subcentre at Nilambur has a unique Teak Museum displaying artifacts and utility items of teak wood, scientific information on various aspects of teak cultivation and wood utilization.

In addition, the museum has a library of world literature on teak, a modern auditorium and nature trail displaying various wild animals.

The Institute has well equipped laboratories to carry out modern research in tropical forestry to cater to the needs of various stakeholders. Some of the major facilities are:

Herbarium: Represented by more than 25,000 specimens of the flora of Kerala, recognized by International Association of Plant Taxonomists with the acronym KFRI.

Medicinal Plants Garden: Live reference collection of about 350 medicinal plant species of the forests of Kerala.

Orchidarium and Fern House: Live-collection of 52 wild orchids and 30 fern species of Kerala forests.

Butterfly Garden: Park attracting and sustaining over 70 varieties of colourful species.

Insect Collection: Reference collection of about 1000 insect species of the Western Ghats of India.

Wildlife Museum: Reference collection of more than 400 specimens of fresh water fishes, amphibians, reptiles and mammals of the Western Ghats.

Wood Treatment Plant: Pilot-scale facility to assess treatability and treatment schedules of different timbers.

Biotechnology and Tissue Culture Facility: Sophisticated facility for molecular characterization and micro-propagation of forest plants.

Nursery and Field Trial Facilities: Attached to Subcentre, Nilambur and Field Research Centre, Velupadam, for laboratory experiments and nursery, species and plantation trials.

Teak Museum: The only one of its kind in the world with exhibits on history, research and development of Teak.

Bambusetum: Live-collection of over 65 native and exotic bamboo species of the world.

Cane Germplasm: Live-collection of 30 species of indigenous and exotic canes.

Xylarium: Collection of over 600 authentically identified wood samples from Kerala and different parts of the world.

National Transportation Planning and Research Centre (www.natpac.org) was established in 1976 as a Division of Kerala State Electronics Development Corporation (KELTRON), a Public Sector Enterprise under the Government of Kerala. In 1982, it was reconstituted as an R&D institution under the Department of Science, Technology and Environment, Government of Kerala. In November 2002, Kerala State Council for Science, Technology and Environment (KSCSTE) was formed, with the objective of adopting a concerted and integrated approach to the research and development activities in Kerala. In February 2003, NATPAC was amalgamated to the new Council and accordingly is functioning as an R&D unit under KSCSTE which is fully funded and supported by the Government of Kerala. The Centre is undertaking research and consultancy works in the fields of traffic engineering and transportation planning, highway engineering, public transport system, inland water transport, tourism planning, rural roads, environmental impact assessment and transport energy.

Rajiv Gandhi Center for Biotechnology (<http://www.rgcb.res.in>) was established exclusively for pursuing research in Biotechnology. RGCB's new, 1,10,000 square feet laboratory complex. In addition, the center has an excellent 350 seat convention center, guest house for visiting faculty and on-campus student accommodation. Rajiv Gandhi Center for Biotechnology is the only institution of its kind within the country, exclusively devoted to Biotechnology, focusing precisely on translational research. All RGCB research programs are created with the underlying concept seeking to promote better health care and improved productivity of spices and medicinal plants. The institute has 6 highly focused research departments working on medical

biotechnology and plant genetic engineering (Molecular Medicine, Molecular Endocrinology & Reproduction, Molecular Microbiology, Cancer Biology, Neurobiology and Plant Molecular Biology). The institute has major interdisciplinary consortium research programs on vaccine development, bioinformatics and bioprospecting for clinically bioactive compounds. A Program of Excellence in Translational Research (PETR) in collaboration with the Regional Cancer Center allows RGCB to carry out leading translational cancer research. True to its commitment to translating biotechnology for economic development, RGCB has started strong industrial collaboration and offers incubator facilities for start up biotech companies. RGCB has also not forgotten its social commitments to the State and provides critical services for the community.

The Center has a Regional Facility for Genetic Fingerprinting, which provides DNA analysis services for forensic & criminal investigations, paternity disputes, identification of wildlife remains, authentication of plants and seeds besides a battery of molecular diagnostics for genetic and infectious diseases. RGCB is also a major provider of laboratory and infrastructure services to other academic and research institutions. A small efficient administration runs the affairs of the center with gracious management from the Kerala State Council for Science, Technology and Environment. The institute is a major stakeholder in human resource development having one of the best doctoral programs in Biotechnology. Admissions to PhD programs take place twice every year in July and December with students being selected from those with National Research Fellowships. Rajiv Gandhi Center for Biotechnology is an institute with a national character led by scientists & research students from various parts of India and a truly national agenda for translating biotechnology into reality at international standards.”

Dr. S. Ganeshan Director of the institute talked about the Tropical Botanic Garden and Research Institute (www.tbgrri.in) which was established with the vision of Conservation and sustainable utilization of the plant biodiversity of India, particularly of Kerala for the well being of her people". The mandate of the institute is

- To make a comprehensive survey of the economic plant wealth of Kerala.
- To conserve, preserve and sustainably utilise the plant wealth of Kerala.
- To introduce, cultivate and culture plants of India/other countries with comparable climatic condition for the economic benefit of Kerala and India.
- To carry out botanical, horticultural and chemical research for plant improvement and utilization.
- To offer facilities for the improvements of ornamental plants and to propagate them in the larger context of establishment of nursery and flower trade.
- To organize germplasm collections of economic plants of interest to the state in the case of those species for which separate centers are not already in existence.
- To establish a model production center for translating the fruits of research to public advantage leading to plant-based industrial ventures.
- To engage in activities, conducive to help botanical teaching and to create public understanding of the value of plant research in general, and the need for preserving our plant wealth.
- To establish an arboretum in approximately half the area of the Garden, with representative specimens of trees of Kerala and India, and trees of economic value from other tropical areas of the world.

To establish a garden consisting of medicinal plants, ornamental plants and various introduced plants of economic or aesthetic value.

To establish laboratories for botanical, horticultural and chemical research, with the aim of improvement and utilization of plants of medicinal and ornamental value.

To prepare a flora of Kerala.

To establish tissue culture facility with special reference to the improvement of seeds/fruits/flowers and quick and easy propagation.

To organize breeding for plant improvement and production of hybrid seeds, in the case of species for which such facilities are currently lacking or inadequate.

To be engaged in garden planning and research.

To serve as a source of supply of improved plants not readily available from other agencies.

To do chemical screening of plants of potential medicinal importance.

To work in collaboration with similar institutes in India and outside

To promote and establish modern scientific research and development studies relating to plants of importance to India and to Kerala in particular.

Thus TBGRI functions for inventory, conservation and sustainable utilization of the plant wealth through appropriate R & D efforts for the welfare of the state and the country at large.

After the lunch presentations were done by the members of the INSTEC delegation under the chairmanship of Dr. EP Yesodharan.



Prof Ramon Wyss of KTH Stockholm talked about the INSTEC, how it was formed and how it would like to work and what it want to achieve. He said INSTEC at present is a consortium of nine universities of Sweden and it would like to expand to contain all universities and probably even industries and NGOs. One of the objectives of INSTEC is to initiate a centre for advanced research in environmental Science and engineering in India to carry out collaborative research programmes between India and Sweden.



Prof. Lars Christer Lundin of Uppsala University talked about a model system for water management, which was very interesting for the participants from the [Centre for Water Resources Development and Management](#) located at Kozhikode in Kerala. Dr. Kamalakshan kokkal of KSCSTE have already established a research link with him.



Prof Björn Karlsson of Lund University talked about various methods of using solar energy for heating and cooling of the built in environment. One research link proposal on solar energy for cooling is being processed between Dr. Ajit Prabhu of KSCSTE and Prof Björn Karlsson of LTH, Lund University.



Prof. Göran Baurne of the royal institute of technology was familiar with kerala state and he had visited kerala in connection with a project on water management a few years ago. He presented the activities of his department of land and water resources engineering at KTH, Stockholm



Prof. Lars Öberg from Umeå University talked about his department of environmental chemistry its research projects and the masters degree programme in environmental science and chemistry which he is in charge of off. A collaboration between Dr. Prakashkumar of the KSCSTE and Prof. Lars Öberg has been also initiated

[Sri Chitra Thirunal Institute for Medical Sciences and Technology \(http://www.sctimst.in\)](http://www.sctimst.in)

In the afternoon we were taken to Sri Chitra Thirunal Institute for Medical Sciences and Technology for a study tour. “The Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), Thiruvananthapuram is an Institute of National Importance established by an Act of the Indian Parliament. It is an autonomous Institute under the administrative control of the Department of Science and Technology, Government of India.

The Institute signifies the convergence of medical sciences and technology and its mission is to enable the indigenous growth of biomedical technology, besides demonstrating high standards of patient care in medical specialties and evolving postgraduate training programs in advanced medical specialties, biomedical engineering and technology, as well as in public health.

It has a 239-bedded hospital for tertiary care of cardiovascular and neurological diseases, a biomedical technology wing with facilities for developing medical devices from a conceptual stage to commercialization, and a center of excellence for training and research in public health.

The Institute has the status of a University and offers postdoctoral, doctoral and postgraduate courses in medical specialties, public health, nursing, basic sciences and health care technology. It is a member of the Association of Indian Universities and the Association of Commonwealth Universities.’’

The Biomedical Technology Wing (BMT Wing), instituted for the promotion of Biomedical Engineering and Technology, is located at the Satelmond Palace at Poojappura, about 10 kilometers away from the hospital campus.

A multidisciplinary team of scientists and engineers along with the supporting staff work here in multidisciplinary areas, varying from biomaterial development and characterization to medical device development, testing and evaluation. A Technoproove Facility exists for the pilot production of medical devices as a link between the institute and industry.

BMT Wing has been instrumental in establishing a medical device industry base in India by successfully developing and commercializing technologies of a number of devices and implants. Some of the commercialised technologies include the production of blood bag, blood oxygenator, hydrocephalus shunt, artificial heart valve, concentric needle electrode etc. Many medical device technologies are at various stages of development, including scale up.

The Biomedical Technology wing has implemented a quality system to meet the requirements of international standard ISO/IEC 17025. About twenty of these tests are accredited by Le Comite Francais d’Acreditation (COFRAC) of France. Test services are open to customers across the globe either from industry, research institutions or academicians.

Meeting with the honourable chief minister of the Kerala state

After the visit to SCTIMST we went to the secretariat of the government of kerala to meet the honourable chief minister Sri V. S.. Achudanandan who is also the president of the KSCSTE.



KSCSTE-Kerala State Council for Science Technology and Environment with its Chairman Chief minister of the state Sri V:S. Achudanandan and the Vice Chairman Dr. Yesodharan received us (Prof. Ramon Wyss and Dr. Göran Baurne of KTH, Prof. Lars-Christer Lundin of Uppsala university, Lars Öberg of Umeå University and Prof. Björn Karlsson and Prof. Baboo M. Nair of LTH, Lund University) and we had a hearty discussion about cooperation in research and education in environmental science and engineering.



Meeting with the honourable chief minister Sri V. S. Achudanandan and the executive vice president Dr. EP. Yesodharan to discuss the cooperation between INSTEC and KSCSTE

The out come of the visit.

In the concluding session we made a review of the visit, presentations study visits and other activities in general, some time was allotted for making a presentation of some concrete proposals from the scientists of Kerala to the visiting delegates to take home to Sweden for further action.

Full political support and cooperation

Personally my judgement is that the visit was reasonably successful. I feel satisfied that I could bring the Swedish university network INSTEC with many different plans and ideas about collaboration with Indian institutions to a meeting table where they could talk to an Indian counter part endowed not only with required political power but also clear understanding of the acute necessity to attack serious problems of environmental pollution and management of waste, water, land, energy and bio-mass by carrying out advanced research and higher education.

Letter of intent

Kerala government is planning to establish an institute for carrying out advanced research in environmental science and engineering and the chief minister extended an invitation to Swedish counter part to take a 50% stake. A letter of intent is to be drafted by the vice president of KSCSTE to be sent to Dr Ramon Wyss of INSTEC for further action in Sweden.

Concrete research link projects evolved at the meetings

1. Dr. Ajit Prabhu of the KSCSTE and Prof. Karlsson of LTH. Lund University have already identified “solar energy for cooling as a theme for a research link project between their respective institutions.
2. Dr. Kamalakshan Kokkal of KSCSTE and Prof. Lars Christer Lundin of Uppsala university also have established contact with each other in producing a research link project on water management
3. Dr, Harikumar of The Centre for Water Resources Development and Management, is al ready involved in a collaborative project with KTH, Stockholm.
4. Dr. Prakashkumar of KSCSTE and Lars Öberg of Umeå University on environmental science and chemistry.

Future plans

1. Organisation of an international seminar and workshop on sustainable development at the end of this year probably/possible in connection with the arrival of the VOLVO ocean race
2. To further develop the details of the proposal on cooperation in establishing an international institute for advanced research and education in environmental science and engineering.
3. A visit by officers of KSCSTE (president, vice president and the principal scientific officer) to Sweden for processing the proposals
4. Visit of Dr. V. Shobha, professor of environmental science, Kerala University, Trivandrum to visit Lund University
5. Preparation of a concept note on the centre for advanced research in environmental science and engineering

In conclusion and to acknowledge

I hope that the good and valuable contacts established and developed during the visit is nurtured and further developed by all the participants and become fruitful not only in an individual level but also in an institutional level to all those students and colleagues whom they represent. I want to thank the honorary chief minister of Kerala State for finding some substance in my letter to him, to the honourable Indian ambassador to Sweden Mrs Deepa Gopalan for timely support and necessary endorsement, to the executive vice president Dr. EP Yesodharan for showing the way, and to the principal scientist of KSCSTE Dr. Prakashkumar for preparing grounds for such a nice meeting and lastly but not the least leadership of LTH, Lund University to appreciate my participation in this mobile workshop and for financial support.

I am rather sure that a few more people in India came to know about Lund University and where it is located in this world after our last visit.

Baboo M. Nair , Lund, 20 April, 2008