

SHORT-TERM EXCHANGE PROGRAMME

INDIA

(18th to 27th November 2013)



By
PIYUSH JOSHI



Aim of the SAHYOG Project:

- The main aim of the project is to **actively link leading organisations** in the field of biomass production and bio-waste conversion research carried out within EU research programmes and related programmes by Indian national institutions
- Contribute to a **joint Strategic Research Agenda (SRA)** finally leading to a Roadmap for Indian and European policymakers and researchers, paving the way **for a sustainable European Indian cooperation** in the field of biomass production and bio-waste conversion.

Objective of the Short Term Exchange Programme

The objective is to strengthen the inter-regional exchange: European researchers was invited to visit Indian institutions, and Indian researchers was invited to visit Europe institutions. The exchange was envisaged for **one week and is fully financed by SAHYOG**. Therewith young talents got the unique opportunity to gain first hand insights of the respective research landscape, make contacts and build new networks.

- ✓ With this component SAHYOG seeks to **increase international cooperation** in order to **jointly contribute** to the development of innovative ideas and solutions in the field biomass production and biowaste conversion.
- ✓ **Connecting young researchers** is an important pillar for a sustainable and long-term cooperation. To enhance the networking and exchange of young talents in Europe and India in the field of biomass and biowaste



DELHI



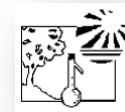
GBPUAT,
UTTARAKHAND



DELHI



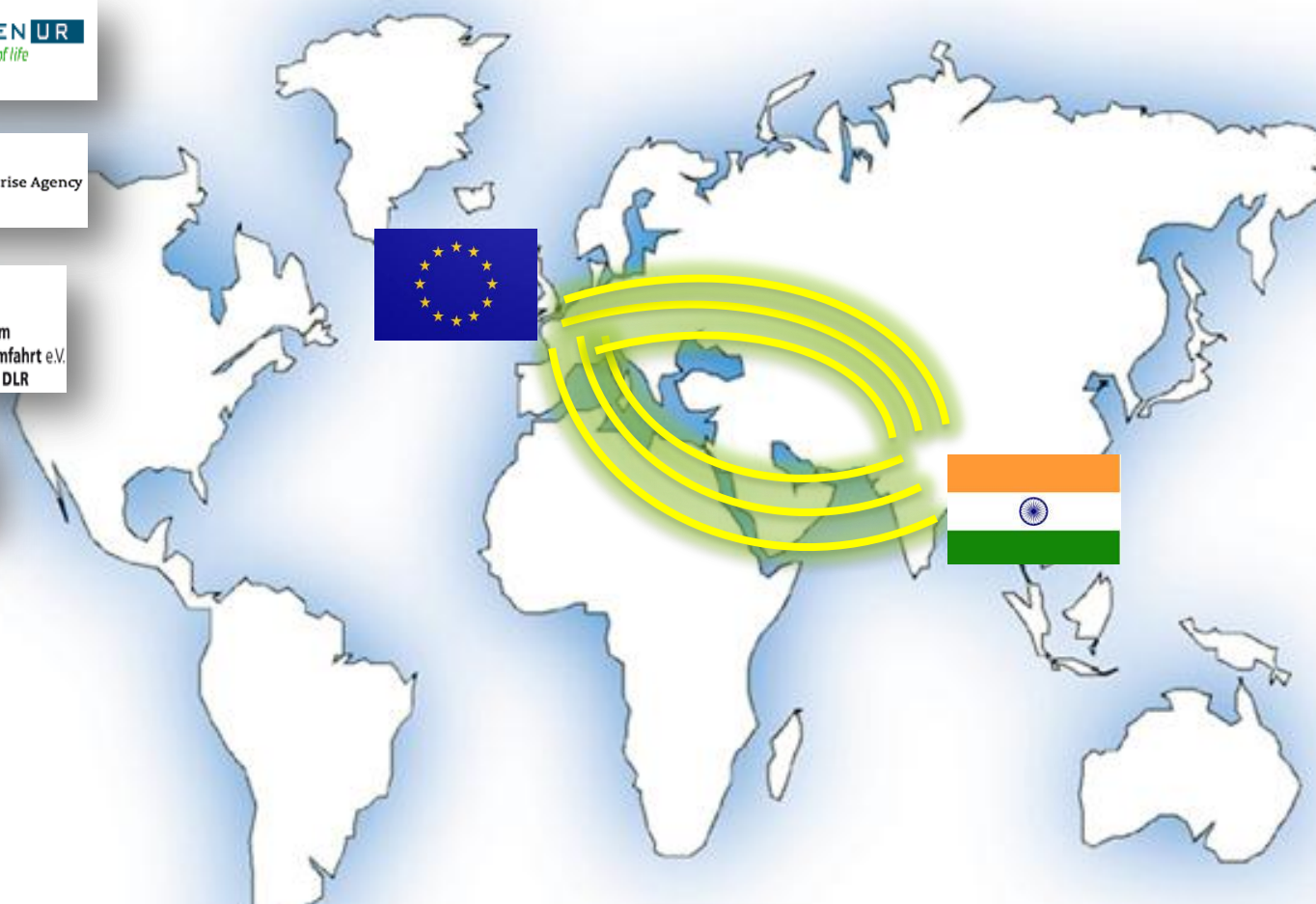
TEZPUR
UNIVERSITY,
ASSAM



ARTI,
PUNE



IIT,
HYDERABAD



SAHYOG Short-term Exchanges Coordinators

Dr. S. Venkata Mohan (India)

CSIR - Council for Scientific & Industrial Research - Indian Institute of Chemical Technology (IICT)
India, Hyderabad

Dörte Merk (Europe)

International Bureau of the Federal Ministry of Education and Research
at the Project Management Agency c/o German Aerospace Center
(DLR)
Germany

European Researchers to India

How programme was initiated

- **A call for proposal addressing junior experts is published in August 2013 on SAHYOG website**
- **The dissemination of call was also done through SAHYOG partners**
- **Screening of the application by experts, based on the academic records and innovative/ creative ideas in a relevant field of research**
- **The candidates were declared winners, and details of the programme was shared**
- **Young candidate were invited to visit renowned research facilities of selected Indian Institutes and Universities**
- **Final list of the round visiting was planned to provide the diversified work experience to the candidates**

Selection of Participants

Eligibility Criteria for Selection:

- ❖ Proven excellent command of the English language
- ❖ A post graduation in the relevant areas with above-average grades
- ❖ Age: up to 35 years
- ❖ As soft criteria was considered the balance of gender and nationalities.

Working in one of the following fields of research:

- ✓ Bioethanol production from lignocellulosic biomass
- ✓ Thermochemical conversion technologies (pyrolysis, gasification)
- ✓ Anaerobic digestion technologies (biogas, biomethane, hydrogen)
- ✓ Algae production and conversion systems
- ✓ Biomass to chemicals – the biorefinery approach
- ✓ Feedstock production and genetic improvement of plants
- ✓ Sustainability and life cycle assessment

Outcome: 20 proposals from EU were selected

S.No.	Origin Country	Applicants
1	Italy	7
2	Germany	6
3	Spain	2
4	Greece	2
5	Hungary	1
6	Portugal	1
7	UK	1

Gender

6 female applicants

14 male applicants

Selected Participants

- The overall seven participants from five countries were selected for the short term exchange programme to India, after evaluation

S.No.	Name	Age	Institution	Country	Research field
1.	Carla Ferreira	26	National Laboratory of Energy and Geology	Portugal	Bioethanol production from lignocellulosic biomass
2.	Gianpaolo Sabia	36	ENEA Research Center Bologna	Italy	Algae production and conversion systems
3.	Axel Funke	35	Karlsruhe Institute of Technology	Germany	Thermochemical conversion technologies (pyrolysis, gasification)
4.	Sebastian Riedel	27	IPK Fraunhofer	Germany	Biomass to chemicals- the biorefinery approach
5.	Joe Bennett	31	University of York	UK	Bioethanol production from lignocellulosic biomass
6.	Zsolt Barta	30	Budapest University of Technology	Hungary	Biomass to chemicals- the biorefinery approach
7.	Dario Prando [#]	26	Free University of Bozen-Bolzano	Italy	-

Dario Prando visited Indian Institute of Sciences (IISc) and did not participated in tour programme

Indian Institute Involved in STExP

SAHYOG Indian Partners involved in Short term exchange programme



The Energy and Resources Institute, New Delhi



**Indian Institute for Chemical Technology,
Hyderabad**



**G. B. Pant University of Agriculture and
Technology, Pantnagar, Uttarakhand**



Jawaharlal Nehru University, New Delhi

Programme outline

➤ Four Universities/ Institutes and three states were selected for visit

	Day 1 (18 Nov-Mon)	Day 2 (19 Nov-Tue)	Day 3 (20 Nov-Wed)	Day 4 (21 Nov-Thu)	Day 5 (22 Nov-Fri)	Day 6 (23 Nov-Sat)	Day 7 (24 Nov-Sun)	Day 8 (25 Nov-Mon)	Day 9 (26 Nov-Tue)	Day 10 (27 Nov-Wed)
Program	Arrival at Delhi and Transfer to Accommodation	Presentation by TERI followed by presentations by EU Interaction session	Lab visit followed by discussion Transfer to Hyderabad	Presentation by CSIR-IICT and EU Lab visit followed by interaction session	R & D Institutes Visit	Local tour In New Delhi	Transfer to GBPUAT Local tour	Presentation by GB PUAT and EU followed by Interaction session Lab and field visit and discussion Transfer to Delhi	Presentation by JNU and EU followed by Interaction session Lab visit followed by discussion	Departure
Station	New Delhi	New Delhi	New Delhi/Hyderabad	Hyderabad	Hyderabad/ New Delhi	New Delhi	Pantnagar	Pantnagar/New Delhi	New Delhi	New Delhi

Visit to TERI (New Delhi)

Day 1: 18th November 2013

Arrival and Welcome in New Delhi, India.

Day 2: 19th November 2013

Registration for the SAHYOG–STE program TERI, IHC.

The Chief Guest (Dr. Vivek Dham, Advisor – Research & Innovation, Delegation of the European Union to India), project partners and speakers were welcomed at the venue.

Welcome of participants by Dr. Priyangshu M Sarma, (Indian Coordinator, SAHYOG), TERI, India

Dr. Neeta Sharma (Project Coordinator SAHYOG), ENEA, Italy, congratulated all the participants and provided an overview of the SAHYOG project .

Mr. Hans Westphal, STE Coordinator, PT-DLR, Germany gave an overview on the STE programme



The Energy and Resources Institute



Session I :

- Presentations by EU Researchers on their research interest and background, their Institute/University and their expectations from the STE program.
- Dr. Deshmukh (President, ARTI) presented a lecture on “Basic technology and rural prospective of biomass in India”



Session II:

- “Biomass Energy Technology Applications in TERI”.
- “Algal Biofuel R&D at TERI”
- “Microbial aerobic/anaerobic process for Bioenergy production”

- “Developing genetic resources and tools in *Jatropha* for biotech assisted improvement”
- “Technological interventions in energy & environmental areas: TERI’s experience”
- Interaction and Discussion session among the researchers and scientists,
- Lab visit at TERI, IHC



Visit to TERI- Retreat (Gwal pahari), Gurgaon

Day 3: 20th November, 2013:

- The EU researchers were taken to TERI Retreat/ Gwal Pahari, which is situated 30 km away from TERI, IHC, New Delhi
- Visit to the TERI Retreat facility and renewable applications showcase (Solar roof, underground Air-conditioning system, wastewater treatment by plant)
- The participants were also taken on a visit to different research centers working on different aspects of biomass and its applications at TERI, Gram (Gual Pahari).



The Energy and Resources Institute



➤ **The facilities visited were –**

- **Biomass Gasifiers system,**
- **Micro propagation technology Park (MTP),**
- **Tissue culture lab/ Poly house visit,**
- **Scanning Electron Microscope (SEM) lab,**
- **Fermentation Technology Research Center (FTRC) having several ranges of fermenter units (1,000 Lt to 15,000 Lts)**
- **Smart Grid were also shown and the European researchers interacted with the experts.**

➤ **Short visit to TERI University which was about 15 km from TERI Gram where the researchers interacted with the faculty and students working in Biomass/Renewable energy**

➤ **Airport : Departure to Hyderabad**



Visit to IICT (Hyderabad)

DAY 4: 21st November 2013 (CSIR-IICT)

- Registration for the SAHYOG–STE program, Committee Room, CSIR-IICT
- Dr. Y V Swamy, Head, BEEC, CSIR-IICT delivered the welcome address and highlighted the work going in CSIR-IICT
- Starts with presentations by EU Researchers on their research interest and background
- Dr. Neeta Sharma and Mr. Hans Westphal, STE Coordinator, gave an overview on the Project and STE programme
- Topics covered at IICT were-
 - “Microbial fuel cell and its multifaceted applications using wastewater as substrate”
 - “Bio-hydrogenesis through waste remediation by optimizing various process parameters”



➤ **“Bioplastics Synthesis through Valorization of Waste”**

➤ **“Photosynthetic Machinery for Sustainable Applications”**



➤ **Ms. Dr. Lakshmi Kantham, Director, CSIR-IICT and Dr. S Venkata Mohan, (SAHYOG-STE Coordinator-India) CSIR-IICT, conveyed there best wishes and presented mementos to EU guest researchers**

DAY 5: 22nd November 2013

- A field visit to ICRISAT, Patancheruvu, Hyderabad
- Scientists from ICRISAT gave a brief talk on the various research activities being carried out in the institute.
- The main crops that are primarily studied at ICRISAT were explained in detail
- A video depicting the various activities of ICRISAT and the benefits offered to farmers was also shown



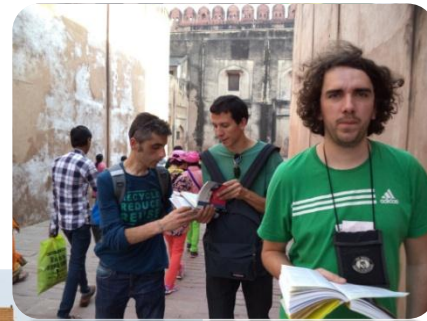
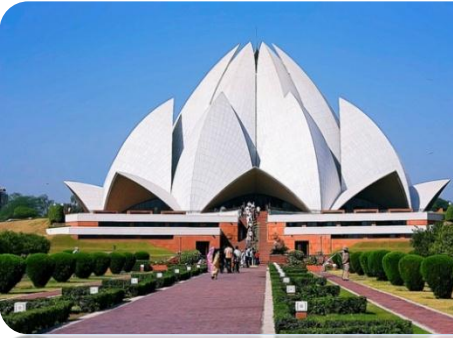
- The EU researchers were taken to city tour and dropped back at the airport to depart to New Delhi.



Day 6: 23rd November 2013

Local tour of Delhi:

A city tour and sightseeing in Delhi was arranged by TERI



Visit to GBPUAT, Pantnagar , (Uttarakhand)

Day 7: 24th November 2013

- **Welcomed at GBPUAT University, Pantnagar**
- **Dr. Reeta Goel welcome the EU researchers and presented a brief detail about Pantnagar campus and academic profile of GBPUAT University**
- **Dr. Anil Kumar discussed about Potential utilization of feedstock waste materials for fuel production**
- **Dr. Pandey discussed about Biotechnology for green energy**
- **EU researchers introduced about their research institutions and current area of research.**
- **Interactive and discussion session**
- **the EU researchers visited the university campus**



Day 8: 25th November 2013

- Visit to the facility at Department of Microbiology, Department of Molecular Biology & Genetic Engineering and the instructional Dairy Farm of the university.
- Facilities visited were vermicomposting technology, feedstock preparation and conversion technology, cattle and poultry farm.



- Mushroom research center, Crop Research Centre, Vegetable Research Centre, Floriculture Research Centre and Agro-forestry research station of the university
- Scientific and social interaction with university students

Visit to JNU (New Delhi)

Day 9: 26th November 2013

- **Welcome note by the Prof. Neera Bhalla Sarin**
- **Prof. Sarin briefed the EU researchers about Jawaharlal Nehru University and School of Life Sciences. She summarized the research being carried out in her laboratory**
- **Followed by brief introduction by EU researchers**
- **The lectures delivered during the session were as follows**
 - **The resurrection plant *Xerophyta viscosa*: Gold-mine for enhancing plant productivity in warming world**
 - **Metabolic engineering of Indian mustard, an oilseed crop, for enhanced stress alleviation and increased productivity**
 - **A strategy for sustainable pest resistance leading to biomass increase**



- Guest lecture delivered by Dr. Abhinav Grover on metabolite engineering to enhance the metabolite production from *Withania somnifera*, a medicinal plant
- Informative session by Dr. Malti Goel (CSIR-Emeritus Scientist) on CO₂ sequestration using biological methods.



- Visit to the research laboratories and advanced facilities in JNU campus
- Visit to glasshouse, Central Instrumentation Facility (CIF) which includes MALDI-TOF, Advanced microscopy facility, DHPLC, 2D Gel Electrophoresis unit, FACS, Elisa Reader and Real-time PCR.

- **Advanced Instrumentation Research Facility (AIRF) at JNU, the most sophisticated, high quality and specialized scientific instruments handled by a team of professionals.**
- **Interaction and discussion with the professors and researchers**

Day 10 – 27th November 2013:

- **Participants were dropped to the airport for departure**



Feedback from Participants

I felt very satisfied after the tour, the trip we covered was extremely well organized and beneficial for us. The program you planned was quite demanding, especially by the end, but in my opinion it is better to have a dense program than a loose one. The time you dedicated for local tours was enough, and I really appreciated your flexibility, when some of us wanted to do the sight seeing individually.

India in one word is incredible, and I totally agree with this:)

It has been informative and useful, so the knowledge should be shared.

It was an excellent program. Although the intensive program was quite demanding, the intensity was also the best point of it.

**Great exchange of
research and cultural
aspects**

**It was useful to get an overview of various research programmes in India over the course of the short term exchange. It gave a good introduction to the industrial landscape in the area of Bio-renewables. The variety - getting to visit different places. The interaction with the India partners
The STE team from Europe - we all got on really well and had a great time together.**

I believe the program was very effective. SAYHOG is a lifetime opportunity to visit and know another country at a scientific level, to get to know top researchers, students and institutions from not only India, but also European “neighbours”. It is a unique opportunity to increase a work contact network and to see the reality of other people lives that motivates them to pursue their goals and directs their research topics.

I gained a lot of relevant information and I feel very enriched from having lived this experience both from the human and cultural point of view. A lot of topics were really interesting and I appreciated a lot the Indian way to carry on the research activities.

Outcome of the Programme:

- ✓ **Great exchange and sharing of ideas and experiences**
- ✓ **Helpful for future collaborative opportunities**
- ✓ **Increased understanding on the topics**
- ✓ **Healthy interaction among the participants and young researchers, from both the side, not only on science and research but also on subjects like culture, social and lifestyles**
- ✓ **Awareness and adoption of alternative, multi-faceted approaches to learning**
- ✓ **Enhanced interest in global issues as well as a broader general knowledge**
- ✓ **Understanding of different cultural and community perspectives**

THANK YOU

