



Sustainable Bioenergy  
Solutions for Tomorrow



**Deliverable 2.3.5**  
**26<sup>th</sup> December 2014**

## ‘Sustainable Bioenergy Solutions for Tomorrow (BEST) – Case India:

### **WP 2 Radical improvement of bioenergy supply chains**

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#### **Task 2.3: Challenges and opportunities in the utilization of Indian biomass resources**

Report on

#### **Subtask 2.3.5: Finnish-Indian partnerships for strengthening research cooperation and developing research methodology (NETWORKING)**

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#### **Partners**

\*VTT Technical Research Centre of Finland, FI-40101, Jyväskylä, Finland

\*Arbonaut Oy Limited, FI-80130, Joensuu, Finland

\*MTT Agrifood Research Finland, FI-31600, Jokioinen, Finland

\*Fortum Oyj, FI-00048, Espoo, Finland

\*Valmet Oyj, FI-33100, Tampere, Finland

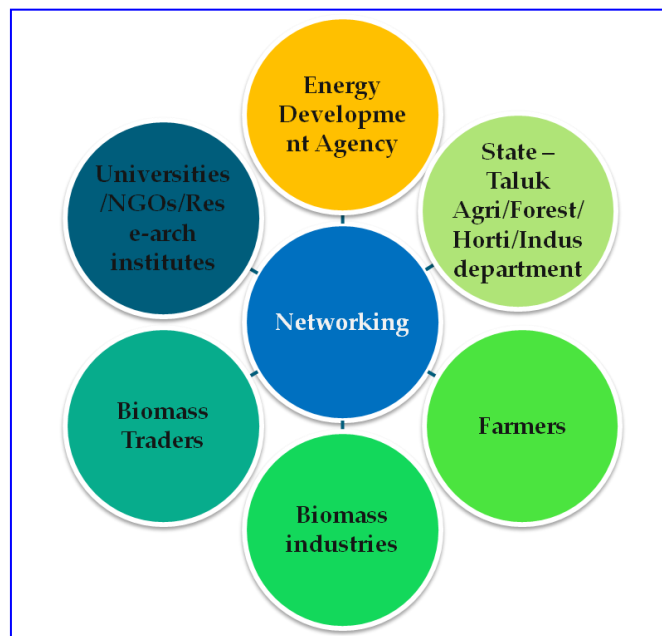
## Acknowledgement

The work was carried out in the Sustainable Bioenergy Solutions for Tomorrow (BEST) research program coordinated by FIBIC Ltd. and CLEEN Ltd. with funding from the Finnish Funding Agency for Technology and Innovation, Tekes. The following partners organizations and research professionals participated in this BEST WP 2 Task 2.3 Case India study.

<b>Partner</b>	<b>Person/-s involved</b>	<b>Role</b>
UEF	Paavo Pelkonen Ari Pappinen Karthikeyan Natarajan Pradipta Halder Anas Zyadin	Energy farming & networking Biomass potential, environment Optimization, biomass resource assessment, supply chain, Societal and policy analysis
VTT	Janne Kärki Arvo Leinonen Markus Hurskainen	CHP, biomass cofiring, techno-economic model Supply chain Analysis of biomass use for energy
MTT	Kaija Hakala	Biomass resources, land use solutions
Arbonaut	Tuomo Kauranne Basanta Gautam Petri Latva-Käyrä	Analysis of geographical biomass information. ArboLidar specialist Development of Internet based solutions for securing the quality in biomass supply chains
Fortum	Marja Englund Matti Sonck Maria Paatero-Kaarnakari Kosti Rautanen (Fortum India)	Energy company point of view on biomass-based energy production concepts, in all subtasks.
Valmet	Matti Rautanen Merja Hedman Ari Kokko R Vishwamoorthy (Valmet India)	biomass combustion analysis, boiler design, CHP
TERI	Suneel Pandey Suresh Chauhan Harminder Singh	biomass resource assessment, MSW, networking

**Sustainable Bioenergy Solutions for Tomorrow (BEST) – Case India** is a collaborative project between Finnish partners and Indian collaborators, which has an important objective to develop modern bioenergy systems and solutions for India to address various social, environmental, and economic challenges in the energy sector of the country. Bioenergy and other renewable energy related policies and programs have been emerging in India over the last decades. These policies and programs, among others, have also emphasized on establishing collaboration and networking among different expert organizations and stakeholders within the country and also with those based in abroad. For example, the *Strategic Plan for New and Renewable Energy Sector for the Period 2011-2017* prepared by the Ministry of New and Renewable Energy (Government of India) has proposed a stakeholder engagement plan by identifying the key stakeholders in the country such as research and development (e.g., technical institutions), equipment manufacturers and technology providers, state governments, regulators, different ministries of Government of India, Indian Renewable Energy Development Agency and other financial institutions, developers and investors, NGOs, and end users. Notably, this *Strategic Plan* emphasizes on developing collaboration with international financial institutions for specific high investment requirement projects of mutual interests.

The BEST project consortium led by the project team based at the University of Eastern Finland (UEF) started networking with a number of Indian organizations since the inception of the BEST project. There has been an increasing realization that networking with Indian stakeholders is a key to success to create awareness of bioenergy systems and solutions in India. Therefore, one of the main objectives of this networking has been to establish local contact points in the selected states of India (i.e., Madhya Pradesh, Maharashtra, and Tamil Nadu) with ministries, bioenergy experts, bioenergy industry, universities, research organizations, and others relevant stakeholders. **Figure 1** shows the categories of Indian stakeholders with whom networking has been started by the BEST project consortium.



**Figure 1.** Categories of Indian stakeholders who were met by the BEST project team

## Networking with Indian stakeholders in Madhya Pradesh, Maharashtra, and Tamil Nadu

During field visits in the three Indian states, the BEST project team met representatives from different sectors such as ministry, industry, academia, local community (e.g., farmers) in order to discuss issues related to development of bioenergy systems and solutions for India. Below is a description of the networking taken place with the Indian stakeholders from the three states and topics of discussions with them.

Name of the organizations/ stakeholder groups	Topics discussed
Forest department	Conditions of Forest Department for signing MoU with Power Company for supplying biomass; Role of forest management committees in supplying the biomass
Agriculture Department	Cropping pattern and agricultural statistics
Department of Industries	Industrial generation of biomass in different districts in the State
Industrial Association	Biomass generating industries in Bhopal; Information about saw mills, brick kilns in Bhopal
Research Institutions	Research in biomass management
Department of Commerce, Industry & Employment	District-wise industrial profile of Madhya Pradesh
State Renewable Energy Development Agency	Biomass potential in the State; Potential of biomass-based power plants in the State
Biomass industry	Biomass supply chain; Biomass feedstock; Cropping pattern; Biomass production; Biomass power production process; Economics and obstacles in biomass power generation and distribution; Economics of briquetting and middlemen for biomass procurement
Biomass trader	Quantity of avg. daily wood saw and biomass produced; Biomass buyers, biomass selling price
Biomass transporters	Transportation of biomass; Logistics; List of biomass transporters in the State
NGOs	Farming systems and social issues in biomass supply chain
Farmers	Village scenarios in and around the localities; Utilization of biomass in rural households
Sugar mills	Sugarcane crushing capacity; co-generation facilities; bagasse-based energy production; ethanol production; supply chain issues
Rice mills	Rice industry waste generated from paddy processing and their utilization

### Pre-conditions for developing successful networking with India-based organizations

The experiences gained during the BEST project indicate that the following pre-conditions need to be met for developing successful networking with India-based organizations for bioenergy related projects:

- Clarifying roles and responsibilities of the Indian partners to be involved in networking with a clear objective for the networking
- Identifying the organizations who are actually able to contribute to the networking objectives
- Collaborating with organizations from all the relevant stakeholder groups in the bioenergy supply chain and also with policy makers
- Maintaining regular contacts through meetings and exchange of information and expertise
- Developing joint projects, which are mutually beneficial to both the Indian and Finnish partners

## **Experiences from cooperation and networking**

The long-lasting partnership between Indian TERI institute and University of Eastern Finland has offered a good basis for efficient networking in BEST-project. The participating Finnish research organizations and companies have been able to utilize large and multi-sided Indian network of TERI institute. It shows the strength of a long-lasting partnership which may offer channels and contacts without any slow and time consuming processes of partner identification with a great number of formalities. The need to utilize existing partnerships is especially important in relatively short programmes such as BEST.

As one example of TERI institute based networking opportunity is annually organized DSDS (Delhi Sustainable Development Summit).The international conference collects together scientists, business specialists, experts of public sector and top level politicians from India and other countries. The participants have excellent opportunities to create new partnership in site events and various kinds of business meetings.

Indian Forest Service Officer's network has been beneficial for various R&D actions of BEST-programme. The IFS officers have studied for their continuous training in the University of Eastern Finland during last four years. Altogether 200 officers have participated in two week training periods in Joensuu. As an outcome of this training there are in each state of India several forest specialists who have good connections to personnel of UEF. When BEST-programme started in 2013 there was an existing network of IFS officers who supported and advised project personnel to sort out many kinds of practical issues related to connections to relevant authorities and local farmers, to data collection and to finding of updated secondary data sources, for instance.

BEST-programme cooperated with many other organizations, as well. Usually project personnel had some kind of earlier connections to those organizations but some collaborators were found through internet. The success of cooperation was not directly dependent on previous connections and cooperation. In some cases old partner's contribution was poorer than expected and a new partner could provide the programme with excellent outcomes. The most important issue seemed to be collaborators' personal generic and specific skills.

## Basic principles of R&D cooperation

The precondition of a successfully innovative environment is properly organized network of cooperation and partnership of the main stakeholder groups. An efficiently organized network is based on the hybridization of elements from university/R&D&T (organized knowledge production), industry (economic wealth generation) and government (normative control) to generate new institutional and social formats for the production, transfer and application of knowledge (Leydesdorff L. and Meyer M. 2006. Triple Helix indicators of knowledge-based innovation systems: Introduction to the special issue. Research Policy Vol. 35).

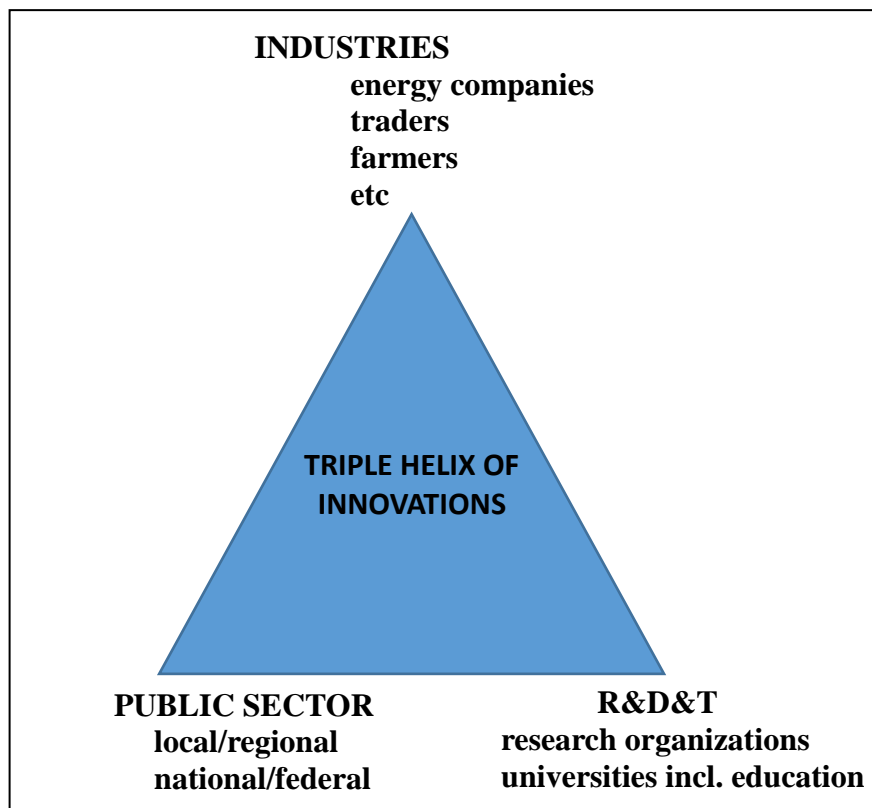


Fig. 2. Triple Helix of a knowledge based innovation system.

Energy sector of different countries has been defined as a strategic business area with a specific normative control of authorities. A strong participation of public sector is usually necessary for a successful innovation process in the states of India. It is also clear that a foreign company or research organization needs many-sided networking with similar Indian organizations for being able to efficiently participate in a cooperation based on triple helix of innovations.

A modern energy system is typically complex. It consists of a great number technologies such as fossil and renewable fuel based production, nuclear, hydro, solar, wind etc. It is a backbone for almost all the societal functions and processes. The need for a strong normative control of authorities takes place in various forms in societies. Due to this complexity research related to energy sector needs multi-disciplinary and inter-disciplinary approaches. This need leads to efficient networking not only in one country but internationally. One strength of BEST-programme has been that a great number of scientists from various field such as natural sciences, social sciences and technology oriented sciences have worked together and carried out research from the point of view of problem solving.

## **Cooperation and networking between India and Finland**

On the basis of networking experiences of BEST-programme it is clear that in depth cooperation is key to success. The network that was established seemed to be optimal. The core team was based on complementary skills of people who had academic degree both from India and from Finland. These researchers were linked to participating Finnish and Indian organizations and researchers. Due to this structure it was possible to ensure availability of sector-vice supply and demand from both countries. It was important to identify complementary expertise of Indian and Finnish partners.

The aim of the programme was to find joint business opportunities of energy sector. Sufficient diversity of knowledge base is needed when opportunities of a complex energy system is studied. Cooperation and networking of Finnish and Indian experts increases diversity for innovative outcomes and solutions. In addition to this, it is also necessary to ensure that the Indian expert base is diverse enough. India is a huge country with an enormous expertise potential. How to identify the relevant human capacity diversity cost-efficiently in India? This is a question that was not properly sorted out during the various phases of the BEST programme.

Technology and knowledge transfer and dissemination of innovations are based on mobility of knowledge and people. When complex issues such as energy systems are transferred it is necessary that people have opportunities enough to travel and meet their partners. BEST-programme had allocated funding for in depth field working that was key to sufficient outcomes of the project. Two researcher from Finland who were familiar and knowledgeable with the Indian society spend several months in the field and worked together with people of established networks. They were able to guide and monitor primary data collection and could find sources of most updated secondary data. They could make decisions dealing with needed changes if it was not possible due to one reason or another to follow the original research plan. Even finding of a relevant secondary data from India might be impossible if researchers would stay isolated in Finland. Even if we are living in an information society the fastest IT based connection can't replace face to face networking and discussions in India and in many other countries.

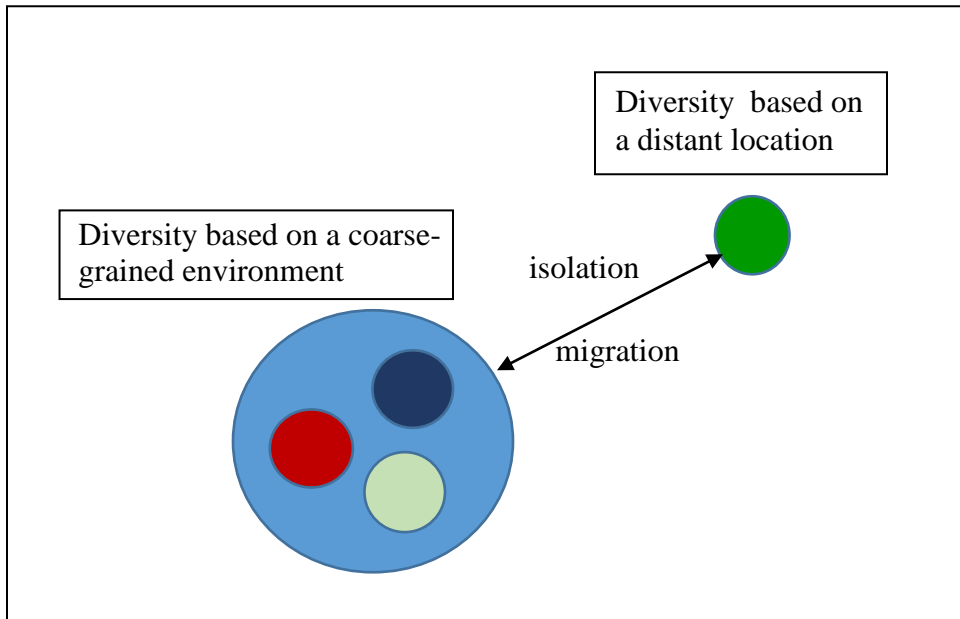


Fig 3. A schematic presentation on diversity sources of innovativeness.

## Future challenges

The main aim of technology and knowledge transfer between two countries is to open a new avenue for business opportunities in one or both of those countries. When a complex system such as energy sector is considered thorough research and development actions are needed before any final decisions can be made. In addition to r&d training and education should be started in many cases for supporting knowledge transfer and for improving an innovation potential.

In the second phase of BEST it would be justifiable to start education of young specialists in joint Finnish-Indian programmes. Young people with relevant BSc or MSc could be trained to get competences to work for biomass based energy system that is utilizing Finnish conversion technologies. The education should be integrated with research and should have an inter-disciplinary and problem oriented approach. After one year studies the specialists will have excellent knowledge on combined needs and expectations of two societal and business ecosystems.

The training shall take place in India and in Finland. It can be organized either by Indian or Finnish universities. Indian and Finnish universities may organize the programme jointly but due to bureaucratic barriers this may not be the most attractive alternative.



## List of experts participating the BEST-network in India

### Details about organization / institutions visited for interaction and collection of relevant secondary data in Madhya Pradesh

S. No.	State : Madhya Pradesh	Name, Designation and Contact Number of Officer Contacted	Document s Collected
1.	Forest Department	Mr. A.K. Joshi Conservator of Forests, Indore (M.P.)	<ul style="list-style-type: none"> <li>• Had discussion on about forest biomass.</li> <li>• Conditions of Forest Department for signing MoU with Power Company for supplying biomass</li> <li>• Role of JFMC in supplying the biomass</li> </ul>
2.	Agriculture Department	<p>Mr. S.N. Sonaniya Assistant Director Agriculture, Department of Agriculture, Collector Office Bhopal (M.P.) Mobile: +91 9425647425</p> <p>Mr. Alok Kumar Meena Dy. Director, Agriculture, Indore Mobile: +91 – 9826364078</p> <p>Mr. Kulshrest, SADO Agriculture Mobile: +91 – 9826630407</p> <p>Mr. B.L. Pathak, Dy. Director, Agriculture, Hosangabad Mobile: +91 – 9826679615</p> <p>Mr. S.R. Lokhandey Dy. Director, Agriculture, Harda Mobile: +91 – 9826018549</p>	<ul style="list-style-type: none"> <li>• Had discussion on cropping pattern in Bhopal district and collected the hard copy of Kharif &amp; Rabi Crop</li> <li>• Collected the details about net sown area with different crops in Bhopal district</li> <li>• Discussed about the cropping pattern and interacted with the farmers with their help</li> <li>• Interacted to know the cropping pattern / net sown area with different agricultural crops in Indore district and also got the weblink <a href="http://www.mpkrishi.org">www.mpkrishi.org</a></li> <li>• Hosangabad and Harda districts have huge potential for biomass residues to be used for power production</li> </ul>
3.	Department of Industries	Mr. Pramod Awasthi Assitt. Director, District Trades and Industrial Centre, Bhopal + 91 – 09425014875 + 91 – 0755 – 2551015	<ul style="list-style-type: none"> <li>• Discussed about industries generating biomass and requested for secondary data – District-wise Industrial Profile of Madhya Pradesh</li> </ul>

		Dr. D.S. Mandloi Director, MSME – Development Institute, Indore 10, Industrial Estate Polo ground, Indore + 91 – 731 – 2421408, 2420723	<ul style="list-style-type: none"> <li>Discussed about industries generating biomass and requested for secondary data – Harbal and Pulses Industries</li> </ul>
	Industrial Association	Mr. R.S. Kharb, Chairman (GIA) Mr. Yogesh Goel, Secretary (GIA) Govindpura Industrial Association (GIA) Association Complex, Industrial Area Govindpura, Bhopal – 462023 India  Phone: +91 – 755 – 4261619 E. MAIL: info@giabhopal.org	<ul style="list-style-type: none"> <li>Discussed with chair-person and secretary of GIA</li> <li>Collected the biomass generating Industries in Bhopal</li> <li>Got the direction to meet with saw mills, brick kiln</li> <li>Also go the website of GIA</li> <li>www.giabhopal.in</li> </ul>
4.	Research Institutions	Dr. Bhaskar Sinha, Assistant Professor (EEM) Ecosystem and Environment Management Indian Institute of Forest Management Bhopal +91 – 755 – 2775716, 2773799 +91 – 9406534297  Mr. Arjun Singh Lib. & Information Officer (IIFM – Lib.) Indian Institute of Forest Management Bhopal +91 – 9329177070 E mail: <a href="mailto:asingh@iifm.ac.in">asingh@iifm.ac.in</a>  Dr. G.P. Tiwari, Indian Farm Forestry Development Corporation Ltd, Bhopal. +91 – 7869962160	<ul style="list-style-type: none"> <li>Discussed about ongoing research in biomass management by (IFFM)</li> <li>Discussed about copy of project work on biomass done by IFFM students and submitted in Library</li> <li>Ready to provide field support, household survey, and future collaboration.</li> <li>Important contact for next level project planning.</li> </ul>
5.	Department of Commerce, Industry & Employment	Mr. Ashutosh Gupta Department of Commerce, Industry & Employment 4 <sup>th</sup> Floor, Vindhyaachal Bhawan, Bhopal – 432004 (M.P.) Phone: +91 – 755 – 2677966, 2677988 Fax: +91 – 755 – 2677943 E. Mail: indsbpl@mp.nic.in Website: mpindustry.org	<ul style="list-style-type: none"> <li>Interacted with concerned officers and collected a report on District-wise Industrial Profile of Madhya Pradesh</li> <li>To get the whole details about industries got the Website of Industries</li> <li>Website: mpindustry.org</li> </ul>

6.	State Renewable Energy Development Agency (MPREDA)	<p>Mr. Avaneesh Shukla Dy. General Manager State Renewable Energy Development Agency (MPREDA) Satpuda Bhawan, Bhopal (M.P.)</p> <p>+91 -755-2526365 +91 -9425382849 E. mail: <a href="mailto:avaneesh.shukla3@gmail.com">avaneesh.shukla3@gmail.com</a></p> <p>Mr. Miritulal Kare +91 -9425003666 E. mail: <a href="mailto:mpnred.biomass@gmail.com">mpnred.biomass@gmail.com</a></p>	<ul style="list-style-type: none"> <li>• Interacted and discussed about biomass potential in Madhya Pradesh State</li> <li>• Potential of biomass based power plant in M.P.</li> <li>• To know the details of existing and future potential for biomass based power plants</li> </ul>
7.	Biomass Based Power Plant	<p><b>Orient Green Power (10MW)</b> Mr. Rajan Kumar, MD and CEO Mobile +91 - 98971095818</p> <p>Mr. Jagdish Dutt Sharma Sr. Manager – Fuels Orient Green Power Company Limited Village – Sookri (Kodia) Tehsil – Gadarwara, Narsinghpur (M.P.) Phone: +91 - 7791 - 243355 Mobile +91 - 8518881182 E mail: <a href="mailto:jdsharma@orientgreenpower.com">jdsharma@orientgreenpower.com</a> <a href="http://www.orientgreenpower.com">www.orientgreenpower.com</a></p> <p>Dr. Sita Ram Mobile +91 - 9799660111 E mail: <a href="mailto:dr.srpatidar@gmail.com">dr.srpatidar@gmail.com</a></p> <p>Mr. H.P. Mishra A. Manager Sriram industries E mail: <a href="mailto:hm@sriramepc.com">hm@sriramepc.com</a> Mobile +91 - 9754008963</p> <p>Mr. Sunil Pyasi, Boiler enigneer E mail: <a href="mailto:pyasisunil@rediffmail.com">pyasisunil@rediffmail.com</a></p> <p>Mr. Dinesh Goswami, Boiler enigneer Mobile +91 - 8518881191 E mail: <a href="mailto:dineshgswami@gmail.com">dineshgswami@gmail.com</a></p>	<ul style="list-style-type: none"> <li>• Interacted to study the biomass supply chain</li> <li>• Collected the secondary data (Annual Report of ASA, ) NGO agreed for supplying biomass</li> <li>• Discussed about biomass production from Napier stalks</li> <li>• Coppice pattern</li> <li>• Arrangement made for production at local level</li> <li>• Explained the power production process.</li> <li>• contact Mr. Seetharam – Napier grass</li> </ul>

		<p><b>Anant Urja Ltd (1.2 MW)</b>  Mr. Rahul Saxena , Chief Engineer  Environment &amp; Energy  Management Group  Pitrachhaya, Kerwa Dam Road,  Bhopal  Phone: +91 – 7556544731  Mobile:+91 –9713087294  E mail: <a href="mailto:saksena.rahul@gmail.com">saksena.rahul@gmail.com</a></p> <p>Mr. Rajinder Singh Bist  DRDO Army Bio- Diesel  Programme  Military Farm, Harsola, Mhow,  Indore  Mobile: +91 – 9977328305</p> <p>Mr. Ranjeet Singh  Scientist – C, DRDO, Harsola,  Indore  Mobile: +91 7324271952</p>	<ul style="list-style-type: none"> <li>• Visited the 1.2 MW Gasifier Power Plant.</li> <li>• Interacted with proprietor of plant, engineers</li> <li>• Discussed about economics, obstacle in power generation and distribution</li> <li>• Visited 100 ha Jatropha plantation site</li> <li>• Discussed about the survival percent</li> <li>• Per plant yield of fruits and seeds</li> <li>• Biodiesel production, production unit</li> </ul>
7.	Biomass Trader	<p>Md. Shahid Ahmed  Biomass Trader  Gala Mandi Road, Paatra, Bhopal  Mobile+91 – 9303424099</p> <p>Mr. Danveer Singh Chhabra  M/s. Vakil Timbers  Manufacturers &amp; Stockists  156 – Guru Nanak Timber Market,  Indore (M.P.)  Phone: +91 –731 –4056860,  Mobile+91 – 9826066603</p>	<ul style="list-style-type: none"> <li>• Visited and collected the data related to total number of Saw Mills in Bhopal</li> <li>• Quantity of avg. daily wood saw and biomass produced</li> <li>• Present buyers, selling price</li> <li>• Visited and collected the data related to total number of Saw Mills in Indore</li> <li>• Quantity of avg. daily wood saw and biomass produced</li> <li>• Present buyers, selling price etc.</li> </ul>

**Details about organization / institutions visited for interaction and collection of relevant secondary data in Maharashtra**

<b>S. No .</b>	<b>State : Maharashtra</b>	<b>Name, Designation and Contact Number of Officer Contacted</b>	<b>Document Collected</b>
1.	Forest Department	Mr. G.D. Sharma 022 2532 9865	<ul style="list-style-type: none"> <li>Had discussion about forest biomass.</li> </ul>
2.	Agriculture Department	<p>Mr. V.B. Nadekar , District Agriculture Officer, Thane + 91 - 588628852</p> <p>Mr. Ajay Patil, Taluka Agriculture Officer, Shahpur, Thane 7588729303</p> <p>Mr.Praveen Kamble, Taluka Agriculture Officer, Murbad, Thane + 91 -9423022131</p> <p>Mr. Diya Nant Jadav, Agriculture Statistics Officer, Pune divisionalstatpune@gmail.com</p> <p>Mr. Ashok Agri supervisor + 91 -9969520757</p>	<ul style="list-style-type: none"> <li>Had discussion on cropping pattern in Thane district and collected the hard copy of Kharif Hangam</li> <li>Collected the details about net sown area with different crops in Thane district</li> <li>Discussed about the cropping pattern and interacted with the farmers with their help</li> <li>Interacted about cropping pattern and got the details about net sown area with different agricultural crops in Pune district and also got the weblink</li> </ul> <p>www.mahaagri.gov.in www.agcensus.nic.in</p>
3.	Department of Industries	<p>Mr. A.R. Chondorikar Director, Directorate of Industries, Thane + 91 – 22 - 2583 3565 + 91 – 022 - 2582 2013</p> <p>Mr. S V. Patil Dy. Director, Department of Industries, Mumbai + 91 – 22 - 22028308 + 91 – 8879635888 svpatil_nsk@hotmail.com</p> <p>Mr. S.R. Londey Dy. Director, Department of Industries, Mumbai + 91 – 22 - 22029086 + 91 – 9822879113</p>	<ul style="list-style-type: none"> <li>Discussed about industries generating biomass and requested for secondary data</li> <li>Discussed about industries generating biomass and requested for secondary data</li> <li>Not available but interacted with his subordinate Ms. Sangeetha Hawanee</li> </ul>

		<p>Ms. Sangeeta Hawanee Industry Officer, Cluster Enterprises Department of Industries, Mumbai + 91 – 22 - 22029086</p> <p>Mr. S.S. Survare General Manager, Directorate of Industries, Pune</p> <p>Mr Nitin Kollekhar Dy. General Manager Directorate of Industries, Pune</p>	<ul style="list-style-type: none"> <li>Discussed about industries generating biomass and requested for secondary data</li> <li>Discussed about industries generating biomass and requested for secondary data</li> <li>Collected the list of industries generating biomass in soft copy.</li> </ul>
4.	Research Institutions	<p>Mr. Vinod Chaudhary Incharge Admin. National Environment Engineering Research Institute, Zonal Laboratory, Mumbai</p> <p>Mr. S.C. Natu Sr. Vice President (Power Division) MITCON Consultancy &amp; Engineering Services Ltd. Pune +91-20- 25533309, +91-20-25534322</p>	<ul style="list-style-type: none"> <li>Discussed about ongoing research in waste management by (NEERI)</li> <li>Collected a note of two page note about biomass available in Pune districts</li> </ul>
5.	Economics Survey of Maharashtra	<p>Directorate of Economics &amp; Statistics. Planning Department, Govt. of Maharashtra, Mumbai 022 2640 0205/178/293</p>	<ul style="list-style-type: none"> <li>Interacted with concerned officers and collected a report on Economic Survey of Maharashtra for the year 2012 – 13</li> <li>Collected soft copy of Handbook Basic Statistics of Maharashtra</li> <li>Collected the weblink to access the relevant data of Maharashtra Statistics</li> </ul> <p><a href="http://mahades.maharashtra.gov.in">http://mahades.maharashtra.gov.in</a></p>
6.	State Renewable Energy Development Agency	<p>Mr. Paresh Bode Project Officer – Biomass Maharashtra State Renewable Energy Development Agency (MEDA) +91-20- 26615031, +91-9372868687,</p>	<ul style="list-style-type: none"> <li>Interacted and discussed about biomass potential in Maharashtra State</li> <li>Got the weblink for more details <a href="http://www.mahaurja.com">www.mahaurja.com</a></li> </ul>
7.	Biomass Based Power Plant	<p>Mr. M. Seshavathram Director, Sri Guruprabha Power Ltd. (10 MW) M – 9272227931</p> <p>Shendra Green energy Ltd (13MW) D-197, Shendra Midc,aurangabad</p>	<ul style="list-style-type: none"> <li>Interacted to study the biomass supply chain</li> <li>Collected the data related to</li> </ul>

		<p>Jalna Road., Aurangabad - 431210, Maharashtra, India</p> <p>Sithi Vinayag Bioenergy Briquetting plant, Amul Patel, Jalgoan.</p>	<p>transportation and biomass traders</p> <ul style="list-style-type: none"> <li>Economics of briquetting and middle men for biomass procurement.</li> </ul>
8.	Transporters	<p>Mr. Kondhu Gharat President, Tractor Owner Union Association, Shahpur Taluka, District Thane + 91 – 9226975486</p> <p>Mr. Bhate Singh Rajput Secretary, Truck, Tempo and Bus Transport Union, Thane District + 91 – 9323779100</p>	<ul style="list-style-type: none"> <li>Collected the data related to transportation and biomass traders.</li> <li>Collected the data related to transportation.</li> </ul>
9	Biomass trader	<p>Johan Air cargo services +91-989046488</p> <p>Mr. Dhananraj Chaudary +91-8380027913</p>	<ul style="list-style-type: none"> <li>Economics of supply chain</li> <li>Trade biomass in huge containers</li> <li>Middlemen, collects biomass for Skendra biomass power plant.</li> </ul>

**Details about organization / institutions visited for interaction and collection of relevant secondary data in Kancheepuram**

<b>S. No.</b>	<b>District : Chennai</b>	<b>Name, Designation and Contact Number of Officer Contacted</b>	<b>Document Collected</b>
	SISSTA	Dr Tangamuthu, Secretary, SISSTA, Chennai 09840125338	Had discussion on sugar mills in Tamilnadu and collected secondary information
	SISMA	Mr Ramakrishna, Secretary, SISMA, Chennai 044-24358329	Had discussion on sugar mills, Production cogeneration, crushing capacity etc and handed over requested letter to issue available secondary data
	RenEnTeks, NGO/consulting company	Ms Sivaranjani and Mr Rangeswamy, Resources persons, RenEnTeks, Chennai 9543962260/ 9894244059 sivaranjani@renenteks.com rengasamy@renenteks.com	Had Discussion about biomass supply chain in Tamilnadu and requested further co-operation for future work.
	TEDA	Mr S. Rajaram consultant Bio-division, TEDA Chennai9443028563	Got information about current status of biomass based industries in Tamilnadu, their capacity, and scope, organization activities, schemes etc
	<b>District : Kancheepuram</b>		
	NEEDS NGO, Kancheepuram	Mr GopalKrishna, Programme Coordinator NEED Kancheepuram, 9443108339	Had discussion on farming system and got farmers contact for household survey and also about rice industries in and around kancheepuram
	Agriculture	Mr V Sundarajan Joint Director of Agriculture, Panjupettai, Kancheepuram – 631 502 Phone: 044-27232790 9487156511	Had discussion on cropping pattern in Kancheepuram and put request to provide secondary information at taluka level
	Horticulture	Deputy Director of Horticulture 4, South Krishnan Street Old Railway Station Near Kancheepuram - 631 502 Phone: 044-27222400 Fax:044-27222545	Had discussion on Horticulture crops in Kancheepuram and collected secondary information on growing area, production and productivity
	Department of Statistic	Ms Dhanalakshmi, Deputy Director of statistics, Kancheepuram 9445458062	Had discussion on basic statist information available with the department and shared some soft copy information on demography, lad use type agriculture, population density etc at district level Collected statist at glance Chennai-2012-13



	Krishi Vigyan Kendra, Katupakam	Dr Gayathri, Asst prof Plant pathology KVK Katupakam. Kancheepuram 9442091883	Had discussion on cropping pattern, got farmers contact for household survey, collected farmers federation group list
	District Industrial Centre	Mr S. M. Ghias General manager and Mr Shanmugam investigator of DIC (9380935522)	Had discussion on Biomass based Industry I Kancheepuram and submitted requested letter to share the secondary data
	Forest department	DFO, Chengalpet division. Kancheepuram  Manager District Forest office Chengalpet division. Kancheepuram 04112-27296500	Had discussion about forest area rights to harvest biomass, protected are, reserve forest, wood depot and put requested letter to share secondary information
	Farmer	Rajgopal progressive farmer Kalakkatur, Kancheepuram	Provided information about village scenario in and around Kancheepuram and explained about utilization of biomass in rural household
	Sugar mills	Mr Sikanna GM Energy and Mr Ashok Cane Ms Padmadevi Sugar / S.V Sugar Mill, Kancheepuram 9445241571	Given information on sugar mill, crushing capacity, co-generation energy production, utilization etc
	Biomass based energy plant	Mohan Beverage's and Distillery Anna Salai, Chennai	Current status of biomass energy plants in Tamil nadu, what is the problem faced by his firm, his firm capacity, what type of biomass they utilized earlier for energy production
	saw mill/ depot	Padmadevi saw Uttarameru  Mr Snatakumar , Uttarmeru 9443294917	Given information saw mill, unit capacity, processing /day waste generation, species used in the saw mill
	Rice mill	Manager Ms Sarathambal Rice Rajastreet Kancheepuram	Given information on rice industry waste generated from paddy processing and their utilization
	Wood trader	Mr Rajanna wood trader, kancheepuram	Shared experience on wood trading