

# **TERI UNIVERSITY**





Established under Section 3 of the UGC Act, 1956 Accredited with Grade 'A' by NAAC

# STATUS REPORT 2014 TERI UNIVERSITY



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# NOTE FROM THE CHANCELLOR



It gives me great pleasure to write a few words on this Status Report, as TERI University approaches a decade and a half of its youthful existence.

Two observations can be put forward in the context of the growth of higher education in India. First, in relation to the number of young people completing higher secondary education, the number of institutions of higher education in this country is woefully inadequate. Even more so is the dearth of good institutions which provide post-graduate education of high quality. Second, there is a dearth of research activities in our universities. In the absence of adequate research, many have become institutions relying on outdated teaching material and dependent on the exercise of rote memory on the part of their students. The absence of a research environment has a negative effect on teaching methods and on the tools of pedagogy employed. As against this reality, universities in the United States, for instance, are institutions where pressure on the faculty to 'publish or perish' is a dominant force in creating a stimulating research environment and fostering original thinking among students, who learn that knowledge cannot possibly be based on mere study of textbooks and conventional publications.

TERI University was established as a modest attempt to fill the void in this country by creating an institution focusing on sustainable development through the provision of graduate education and building a research-based institution. TERI University not only imbues its alumni with a set of values embracing human progress by inclusion of environmental considerations and the state of our natural resources but also an institution that helps to develop creative abilities and a spirit of innovation. Another major asset of this University is its all-round effort to provide students with an access to the rich research material produced on a large scale and on a continuous basis at TERI itself. Hence, this University has the benefit of all that an excellent institution of higher learning provides, along with complete access to a reservoir of activities in TERI, the foremost institution of its kind in the world.

Dr R K Pachauri

Director-General, TERI, and Chancellor, TERI University

# NOTE FROM THE VICE CHANCELLOR



Already awarded an 'A' grade by India's National Assessment and Accreditation Council (NAAC), the Greenest University 2013 by RTCC Global Climate Change Awards, and as the University with the Most Innovative Curriculum Award at the India Today Aspire Education Summit in 2012, the TERI University continues to strive for excellence through a range of initiatives addressing not just the teaching–learning environment but also through faculty development and engagement programmes and strengthening of supporting infrastructures. A University that has uniquely positioned itself to provide a systemic learning and solutions approach to the major sustainability challenges that are being faced by the country and the world at large, it is reaching out to, and attracting, a range of national and international partners to enhance its societal contribution.

The University is proud to be able to recognize the work of eminent scientists, leaders, and game-changers on important aspects of sustainable development through the award of honorary doctorates. It is also privileged to be one of less than a dozen universities in India to host a UNESCO Chair. This Chair, on Climate Science and Policy, is occupied by Prof. V Ramanathan, Distinguished Professor of Atmospheric and Climate Sciences, Scripps Institution of Oceanography, University of California, San Diego, and is a recipient of the UNEP Champions of the Earth Award (2013).

The University has benefited enormously from the contributions made by faculty members from our partner/collaborating universities such as the FES at Yale University, USA; the Earth Institute at Columbia University, USA; the Deakin University, Australia; the Freie University Berlin, Germany; the United Nations University, Japan; a long-term visiting professor supported by the German Academic Exchange programme (DAAD); the Open University, United Kingdom; and the Utrecht University, the Netherlands. These relationships have ensured an internationalization of the curriculum offered by TERI University and an opportunity to adapt pedagogical innovations.

New learning experiences are being provided to both our students and the wider community in the form of seminar courses and a range of summer schools aimed at exciting all stakeholders about a more systemic, solutions-oriented, multi-disciplinary approach to learning about, and addressing, the evolving challenges to sustainable development. The seminar course on 'India's Challenges to Sustainable Development' brought together some extremely eminent policy-makers and practitioners to share their knowledge with the academic community at the University. Similarly, the seminar course on 'Ethics for Sustainable Development' set the tone for new entrants into the TERI University by engaging them on what constitutes sustainable development and the ethical dimensions of developing in a sustainable manner.

The faculty members at the University are engaging and investing effectively in creating niche multi-disciplinary learning programmes for the students as well as establishing a culture of discipline and ownership that is so essential for ensuring sustainable development in all stages of life, in facilitating experiential learning and critical thinking, and in encouraging them to engage in extra-curricular activities to ensure fuller overall development. Taking two days out every six months to reflect on challenges and successes in a faculty retreat, the faculty members from different programmes/departments in the University are striving to create a uniform culture of opportunity, innovation, and performance across all dimensions of academic life.

Dr Leena Srivastava

Vice Chancellor TERI University

# NOTE FROM DEAN (ADMIN) AND REGISTRAR



This year marks the 11th anniversary of the launch of TERI University's exciting programmes. The richness of its programmes represent a refreshing flavour of innovation and a strong relevance for addressing the challenges of tomorrow. This decade of enterprise has enthused faculty members and the administrative staff to push towards greater growth of ideas, pedagogical tools, student facilities, and a seemingly insatiable quest for new knowledge in the realm of sustainable development.

The last one year has seen focused efforts, towards consolidation of curriculum and processes and a move towards a minimal-paper campus. From grading students, to attendance, to leave applications, the use of the traditional registers and files are being minimized. The IT division at TERI has been instrumental in devising homegrown solutions to these requirements.

TERI University believes in the significance of providing its students extensive practical exposure along with invaluable academic inputs to ensure their holistic development. A constant interface between classroom training and on-the-job training through summer internships and major projects in world-class organizations ensure the perfect blend of business acumen and academic intellect.

The placement cell has been strengthened with a full-time placement manager acting as the focal point for prospective employers. The University provides the very best in equipment and instruments, which includes state-of-the art computer hardware and software, well-equipped laboratories, video-conferencing facilities, and access to South Asia's most comprehensive library on energy and environment. The infrastructure at the University is constantly reviewed so as to ensure that a stimulating atmosphere is available to the students, for studies, research, and for recreation.

The Fifth Convocation of the TERI University was held on 30 January 2013. In this ceremony, accompanied with much grandeur, six doctoral and 248 master's degrees were awarded. Mr Sam Pitroda, Adviser to the Prime Minister (Public Information Infrastructure and Innovations), was the Chief Guest and Prof. Carlo Rubbia, Nobel Laureate, was a Special Guest of Honour. Both were awarded honorary doctorates. In addition, honorary doctorates were also awarded to Mr Nassir Abdulaziz Al-Nasser, President of the 66th session of the UN General Assembly; Mr Zhang Yue, Chairman of BROAD Group, China; and Mr Thomas Friedman, Journalist and Columnist, The New York Times.

Stressing on the importance of the international perspective in its programmes, TERI University has entered into Memorandums of Understanding (MoUs) with several international universities aimed at facilitating a mutually beneficial exchange of

students, faculty, knowledge, resources, and ideas. The University encourages the exchange of ideas, cultural understanding, and wide range of knowledge that would result from an international exposure. In 2007, the University launched an academic exchange programme with Yale University (School of Forestry and Environmental Studies) with support from the V K Rasmussen Foundation. In 2008, the University launched another academic exchange programme with Freie University of Berlin, Germany, with support from DAAD (the German Academic Exchange Service). In 2013, MoUs for academic exchange and cooperation were signed with the Simon Fraser University, Canada, and with Deakin University, Australia.

In November 2012, the Director-General, UNESCO, Ms Irina Bokova, came to the TERI University to officially launch a UNESCO Chair in Climate Science and Policy. Dr V Ramanathan, a renowned atmospheric scientist, and professor at the Scripps Institute of Oceanography, University of California, San Diego, has been nominated to this Chair at TERI University.

In 2009, four scholarship programmes were set up for students in different programmes at the TERI University, funded by Sindicatum Climate Change Foundation, HSBC, Deutsche Bank, and Indian Oil Corporation Ltd (IOCL), respectively. These continue to benefit 10 students annually.

From launching the first doctoral programme in 2001 with 13 students, and Master's programmes in 2003 with 19 students, to 117 doctoral students and 508 Master's and PG diploma students on the roll in the academic year of 2012, the University has come to stand for excellence and quality within a remarkably short span of time. Over this period, the University has grown to offer a wide range of academic programmes related to sustainable development.

The University firmly believes that ample opportunity should be provided to students to unwind and relax. From participating in presentations to displaying their creative talent in the University's annual festivals, students have many ways in which to take a break from classroom rigour.

**Dr Rajiv Seth** 

Dean (Admin) and Registrar **TERI University** 

# FACULTY OF APPLIED SCIENCES

Dean's Report



The Faculty of Applied Sciences (FAS), with three departments and one centre, is committed to carry out teaching and research in the area of sustainable development. These are the Department of Natural Resources (DNR), Department of Biotechnology (DBT), Department of Energy and Environment (DEE), and the Centre of Bioresources and Biotechnology (CBB). Teaching and research ensure a multi- and inter-disciplinary approach that is required to address complex sustainability issues that cut across disciplinary boundaries. The pedagogy integrates information and knowledge from different disciplines.

A major exercise in the programme review was undertaken by the DNR, wherein, the existing three MSc programmes in Environmental Studies, Natural Resources Management, and Water Resources Management were consolidated into a common inter-disciplinary programme, known as Environmental Studies and Resources Management (ESRM). This was based on feedback from academia, students, and industry and done after a series of brainstorming sessions. The curriculum has been designed by seamlessly integrating the concept of sustainable development in an inter-disciplinary framework. The programme aims to develop a holistic approach to environmental and resource problems in students from diverse academic, professional, and cultural backgrounds. The Department is also in the process of reviewing its other two MSc programmes — 'Climate Science and Policy' and 'Geoinformatics'.

The faculty members are known to the academic fraternity through research publications, participation in workshop/seminars, and also international collaborations. Most of the faculty members under the FAS have been publishing their research in high impact factor peer reviewed journals; in the last academic year, faculty members contributed around 85 research publications. The faculty members have also received several prestigious research grants which include the PEER Science grant by the National Science Foundation, USA; USAID; Natural Environment Research Council (NERC); Ecosystem Services for Poverty Alleviation (ESPA) programme; National Aeronautics and Space Administration (NASA); German Academic Exchange Service (DAAD); Department of Science and Technology; Department of Biotechnology; Ministry of Environment and Forests; Ministry of Drinking Water and Sanitation, Ministry of Food and Consumer Affairs; and Ministry of Human Resource Development. Several research facilities have been added to the biotech laboratories through extramural research funds, which include transgenic net-house facility, plant growth room, biosafety Level III facility, a biosafety cabinet, gas chromatography unit, nanodrop, two deep freezers, two refrigerators, incubator shaker, and an ice-flaking machine. Two patents were filed in 2012 by faculty members from the DEE. The FAS in consonance with the University's policy of strengthening international linkages has encouraged both faculty members and students to establish research collaborations with foreign universities of repute. In this regard, faculty members, masters, and doctoral students

have visited several universities which include Freie University, University of Freiburg, Yale School of Forestry and Environmental Studies, University of Birmingham, Surrey University, University of Ulster, Derby University, and other institutions for joint research activities. This has resulted in a few good joint result publications and joint funding opportunities.

The students and faculty members have also been involved in organizing summer/ winter schools and cultural events. In this context, the DBT organized 'BIOTIKOS 2013' on 10–11 April 2013 under the theme 'Current Challenges of Bioinformatics in Biotechnology. The two-day programme was a great success with over 300 students and faculty researchers participating. The event was sponsored by the Department of Biotechnology (Government of India) and Monsanto India. The DEE annual event 'REtopia' was aimed to promote renewable energy in the country and to build good corporate relationships. It attracted delegates from IREDA, MNRE, BEE, IITs, IEX, NPL, IOCL, Suzlon, TCS, L&T, IT Power, Bridge to India, TERI, and students from across the country. It was a great success and widely appreciated.

The FAS has several plans to review and update its programmes and to initiate new programmes that are unique and have societal relevance in the coming year.

**Dr Prateek Sharma** 

Dean, Faculty of Applied Sciences

TERI University

# FACULTY OF POLICY AND PLANNING

Dean's Report



The academic year 2012–13 witnessed many successful efforts in the Faculty of Policy and Planning towards strengthening of existing degree programmes, launching of new initiatives in the field of higher education in the country, and developing synergistic activities focused on research, outreach, and executive training. During this period, the two constituent departments of the faculty — the Department of Policy Studies and the Department of Business Sustainability — strove hard to sincerely fulfil a common mandate to integrate sustainable development issues in post-graduate education for public policy and business management, respectively, and provide the corresponding capacity requirements.

One of the highlights of the past academic year was the successful completion of the various stages of the preparatory process which culminated in the July 2013 launch of the MTech Programme in Urban Development and Management by the Department of Policy Studies. The two-year programme is a response to a national need for competent professionals with technical skills, managerial capabilities, and an understanding of socio-economic, environmental, and legal issues associated with urban development, infrastructure and services, and real estate development. With the formal constitution of the Department of Business Sustainability in June 2012, the MBA programmes of the University are now better organized for academic quality control and building partnerships with industry.

There are always areas for improvement in academic programming and to this purpose the faculty has set up a system by which there is regular and independent assessment of each programme by a Programme Advisory Committee (PAC). A major curricular revision was successfully completed for the MA-PPSD Programme following the recommendations of the Bansal Committee, set up by the Department of Personnel and Training, Government of India. Our partnership with the Global Association of MDP Programmes has facilitated extensive peer review of the MA-SDP Programme and experience-sharing at the international level.

The faculty is committed to continuous pedagogical improvement and this is evident in a number of innovative but well-considered learning components introduced in the Masters' programmes. For instance, the Exposure Project — a second semester credit-carrying course — has been introduced in the MA-PPSD Programme to provide an opportunity for participants to get associated with ongoing research projects in TERI and actively learn from the experience. The MA-SDP Programme further streamlined its structured field-training component, which is spread across all four semesters and designed to comprehensively equip participants with problem-solving skills in real life situations. The MSc Economics Programme, with a view to strengthen its focus on environmental and resource economics, has introduced a carefully crafted dissertation work spread over the third and fourth semesters. This requires the students to write

a dissertation on topics relevant to environmental and resource economics, under supervision of the faculty, which enables them to undertake in-depth research work, keeping in mind the analytical tools and statistical packages taught during the course.

Management Development Programmes (MDPs) and seminars were organized on themes relating to challenges and opportunities in making cities climate resilient, leadership for sustainable urban development, concerns for sustainability in urban planning, and sustainable human settlements. The target audience included government officials, private sector representatives, students, and faculty members from NCR Delhi and other parts of the country. The quality of academic programmes offered by the departments is reflected through the continuing support received from the Government of India and institutions such as the Open Society Foundation, the World Bank, DLF Foundation, and HUDCO. The University has entered into an MoU with HUDCO to support doctoral research in a habitat-related sector. A partnership opportunity has been created between the Ministry of Power, Government of India, and TERI University in which, to start with, a couple of MBA students were placed in the Ministry to do their Masters' dissertation work under a joint supervision/ mentorship arrangement.

There are now vibrant and mutually beneficial partnerships with reputed universities worldwide. A number of faculty members have been invited to give lectures abroad and participate as resource persons in national and international seminars, workshops, etc. Under the BC-India Mobility Initiative, faculty visits from both sides have finally resulted in collaboration with the Simon Fraser University in British Columbia, Canada.

New colleagues have also joined the Faculty to enhance its multi-disciplinary profile, encompassing disciplines such as Economics, Law, Sociology/Anthropology, Engineering, Planning/Architecture, and Governance. Members of the Faculty have been actively engaged in funded research on a wide range of themes such as climate change, sustainable urban development, water and transport infrastructure, and community rights. The research output of faculty members have been published in high quality peer-reviewed journals and received appreciation at several national and international conferences. To conclude, the Faculty is poised to build on its achievements during the years to come.

Dr Arabinda Mishra

Dean, Faculty of Policy and Planning **TERI University** 

Araboinda Mibras

# BOARD OF MANAGEMENT

### Chairman

Dr R K Pachauri

Chancellor

Members

Dr Leena Srivastava

Vice Chancellor

Secretary

Dr Rajiv Seth

Dean (Admin) and Registrar

Nominee of the Government of India

Air Marshal K K Nohwar (Retd)

Nominees of the Chancellor

**Dr Yasmine Hilton** 

Chairman, Shell Companies in India

Mr Tulsi R Tanti

Chairman and Managing Director Suzlon Energy Limited

Mr Viren Shetty

Executive Director, Narayana Hrudayalaya

Mr Ashok Lavasa

Secretary, Ministry of Civil Aviation

Nominee of Sponsoring Society

Mr Shri Prakash

Distinguished Fellow, TERI, and Former Chairman, Standing High Power Committee, Ministry of Railways

Deans

**Dr Prateek Sharma** 

Faculty of Applied Sciences

Dr Arabinda Mishra

Faculty of Policy and Planning

Academic Professionals (Teachers)

Prof. P K Joshi Mr S Sundar Prof. Manipadma Datta

Mr T N Thakur

Former Chairman and Managing Director

PTC India Limited

Prof. Parthasarathi Shome

Adviser to the Finance Minister

Mr Prashant Bangur

Director, Shree Cement Limited

# ACADEMIC COUNCIL

### Chairperson of the Council

### Dr Leena Srivastava

Vice Chancellor

### Dean (Admin) and Registrar

### Dr Rajiv Seth

### Deans of Faculties

### Dr Arabinda Mishra

Dean, Faculty of Policy and Planning

### **Dr Prateek Sharma**

Dean, Faculty of Applied Sciences

### Nominees of the Chancellor

Dr Paramjit Khurana, Professor, University of Delhi

Dr B P Murty, Professor Emeritus, JNU, Delhi

Dr V K Jain, Vice Chancellor, Doon University

**Prof. T C Kandpal**, Professor, Indian Institute of Technology, Delhi

Prof. Mihir Deb, Professor, University of Delhi

### Co-opted Members

Dr Kamala Sankaran, Professor, University of Delhi

Dr Ravi Shanker, Professor, Indian Institute of Foreign Trade, Delhi

**Dr Vishal Narain**, Associate Professor, Management Development Institute, Delhi

Prof. Santosh Panda, Chairperson, National Council for Teacher Education

Prof. M N Murty, Retired Professor, Institute of Economic Growth, University of Delhi

### Heads of the Departments/Centres

### Dr Najmur Rehman

Head, Department of Energy and Environment

### **Dr Suneel Pandey**

Head, Centre for Regulatory and Policy Research

### Dr Sanjay Saxena

Head, Centre for Bioresources and Biotechnology

### Dr P K Joshi

Head, Department of Natural Resources

### **Dr Shaleen Singhal**

Head, Department of Policy Studies

### **Dr Anandita Singh**

Head, Department of Biotechnology

### Dr Manipadma Datta

Head, Department of Business Sustainability

### **Professors**

**Prof. S Sundar Prof. Arun Kansal** 

### Faculty

### **Mr Amit Kumar**

Department of Energy and Environment

### Dr Kaushik R Bandyopadhyay

Department of Business Sustainability

### Dr Mala N Reddy

Department of Policy Studies

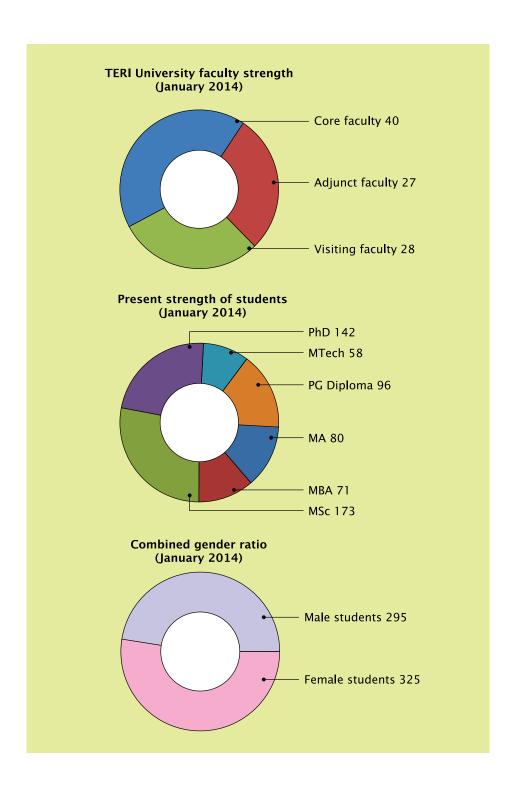
### Dr Sitaraman Ramakrishnan

Department of Biotechnology

### Dr Suresh Jain

Department of Natural Resources

# STUDENT-FACULTY STRENGTH



# STRUCTURE OF TERI UNIVERSITY AND PROGRAMMES

### Administration

The University has a Board of Management, which is responsible for its overall administration. The Chancellor is the Chairman of the Board. The Academic Council decides the academic policy and approves of curricula, courses, and examination results. It appoints committees to look into specific academic matters arising from time to time. The Vice Chancellor is the Chairperson of the Academic Council. The Finance Committee renders financial advice. Dr R K Pachauri is the Chancellor, Dr Leena Srivastava is the Vice Chancellor, and Dr Rajiv Seth is the Dean (Admin) and Registrar of the University.

### Structure

The University has evolved as an organizational structure drawing on the research activities of TERI. Besides the core teaching staff of the University, staff of TERI with PhDs and rich research experience of working on projects in various areas, act as adjunct faculty.

There are two faculties, namely, the Faculty of Applied Sciences and the Faculty of Policy and Planning. There are centres and departments under each faculty.

### **Faculty of Applied Sciences**

### **Centre for Bioresources and Biotechnology**

This centre is dedicated to promoting and advancing innovative research with emphasis on management of plant and microbial bioresources.

### **Department of Natural Resources**

This department aims to advance and impart knowledge about the environment and natural resources, including their characteristics and dynamics, their economic and societal value, and their management.

### **Department of Energy and Environment**

This department aims to advance and impart knowledge in aspects related to clean technologies, renewable energy management, and especially in the interface between energy and the environment. It is also engaged in research in the broad area of clean technologies to achieve energy efficiency and minimize adverse environmental impacts.

### Department of Biotechnology

This department aims to advance and impart knowledge about plant biotechnology and carries out research with emphasis on management of plant and microbial bioresources.

### **Faculty of Policy and Planning**

### **Department of Business Sustainability**

This department aims to provide research-based education that would equip students to implement an integrated approach to business sustainability.

### Centre for Regulatory and Policy Research

This centre seeks to enhance and augment current understanding and implementation of policies and regulation to encourage sustainable development.

### **Department of Policy Studies**

This department aims to achieve a critical mass of expertise and academic excellence that would provide a basis for influencing public policy and regulatory practice.

### Academic Programmes

At present, the following programmes are offered:

- PhD
- MSc (Environmental Studies and Resource Management)
- MSc (Geoinformatics)
- MSc (Climate Change Science and Policy)
- MSc (Plant Biotechnology)
- MSc (Environmental and Resource Economics)
- MA (Public Policy and Sustainable Development)
- MA (Sustainable Development Practice)
- MBA (Infrastructure)

- MBA (Business Sustainability)
- MTech (Renewable Energy Engineering and Management)
- MTech (Urban Development and Management)
- Advanced PG Diploma in Renewable Energy (Distance mode)

The academic programmes of the University integrate the research experience gained in TERI into the academic curricula to provide a practical and contemporary context to learning. Having begun with doctoral programmes in 2001, TERI University since 2003 also offers various master's degrees.

### **Doctoral Programmes**

The doctoral programmes and research at the University centre around five basic themes: (i) natural resources management, (ii) biotechnology, (iii) policy and regulation, (iv) energy and environment, and (v) business sustainability.

### Details of Master's Programmes

# MA (Public Policy and Sustainable Development)

Policy decisions by government officials at all levels are required to be increasingly multifaceted, keeping in mind the dynamics of economic reforms and the need to ensure that decision-making contributes to sustainability of the development process. Private, not-for-profit, and for-profit business entities also have a bearing on development-related policy decisions. To respond effectively to these issues, civil servants and those engaged in the non-governmental sectors, need to:

- Be trained in the politics and economics of public policy and in sophisticated methods and tools of analysis, and
- Refresh their knowledge of the substantive development issues at hand.

The MA (Public Policy and Sustainable Development) [MA(PPSD)] programme offered by the University encompasses a comprehensive and well-structured two-year curriculum on public policy formulation, analysis, evaluation, management, and links with development concerns.

With a judicious mix of courses covering basic concepts, a practical orientation, and new methodologies and tools, the programme intends to allow future leaders in the governments and other agencies to enhance their awareness of the overall public policy environment in which they have to make decisions. The Programme is also intended to sharpen the understanding of the effects that policy decisions have on political, economic, social, and environmental aspects in domestic and international domains.

### **MA (Sustainable Development Practice)**

The Master's course in Sustainable Development Practice seeks to address a critical gap in sustainable development education in South Asia, where such capacity creation is essentially called for. TERI University was one of the few universities worldwide selected by the John D and Catherine T MacArthur Foundation, to receive a seed funding to create the new master's degree programme in development practice. Consequently, TERI University introduced MA in Sustainable Development Practice [MA(SDP)], which is now a part of the network of Global Masters in Development Practice (MDP).

MA(SDP) aims to develop an international cadre of development professionals, well-equipped to tackle, beyond cultural boundaries and across sectoral divisions, the interwoven challenges of extreme poverty, disease, climate change, and ecosystem vulnerability, specific to the region. It is designed on the basis of the recommendations of the global situation analysis of development training programmes undertaken during 2007–08 by the International Commission on Education for Sustainable Development Practice.

### **MBA** (Business Sustainability)

The MBA (Business Sustainability), intended for both fresh graduates and mid-career professionals, is an effort to align leadership in both industry and government to current contexts. In doing so, this programme seeks to enhance the scope and knowledge body of management education in India by imparting conventional management skills to students as also by helping them develop new perspectives related to the integration of sustainable and ethical practices into management education. The students of this programme will be well equipped to meet the demands of a fast changing world. This is not just an MBA programme; it is an MBA+ programme. This programme combines the conventional MBA curriculum with new sustainability challenges that have direct impact on a firm's future performance financial and otherwise. The programme also leverages TERI's knowledge capital in sustainable development to deepen the social and ethical consciousness of management education in India. The graduates of this programme will become competent business leaders with a holistic and long-term perspective for a world that demands new skills and attitude.

### **MBA** (Infrastructure)

Management education is deep rooted in India with a large number of universities offering MBA degrees. The MBA (Infrastructure) programme at TERI University brings together this knowledge capital in a set of courses that cover all traditional business administration disciplines such as marketing, finance, and strategy, in addition to catering to the need for a cadre of professionals with training for operation, management, and financing of infrastructure services. The aim is to achieve a critical mass of expertise and academic excellence for effective management of, and for influencing public policy and regulatory practice in infrastructure industries.

The MBA (Infrastructure) programme encompasses a comprehensive and well-structured two-year curriculum designed specifically to provide specialized training in the concepts and skills involved in the infrastructure service

delivery, regulatory process, and competition policy, as well as helping the managers understand regulation from technical, economic, social, legal, and political perspectives. The programme is open to both mid-career professionals and fresh graduates.

### MSc (Climate Science and Policy)

Climate change is a pressing environmental concern in the present era of development, with implications on energy, water resources, agriculture and food security, ecosystems and biodiversity, coastal zones, and human health. Changes in global temperatures are expected to increase the frequency and intensity of current natural hazards and extreme events whose consequences are likely to be felt most intensely by poor and vulnerable communities in society.

Addressing climate change requires a good scientific understanding, as well as coordinated actions and policies at the local, national, and global levels. As part of the community of scientists searching for solutions, TERI University offers a programme leading to the award of an MSc in Climate Science and Policy. This is an intensive four-semester programme intended to imbue present and future professionals in the arena with practical and theoretical knowledge in the scientific and policy issues relevant to climate change.

### **MSc (Economics)**

The rapid structural economic changes in developed and developing countries in the second half of the 20th century have created increasing pressure on environmental and natural resources. Though the need to protect the environment is recognized by most societies, how to achieve a balance between economic growth, social welfare, and environmental health is widely debated. Environmental and Resource Economics is a new and exciting branch of economics, which integrates the discipline of economics with environmental sciences. It analyses the conflict between production and consumption patterns of the societies and the limits imposed by the environment.

The MSc Economics programme (with specialization in Environmental and Resource Economics) examines the application of economic theory to environmental and natural resource issues within an interdisciplinary setting. The programme targets students who wish to become professional environment and resource economists in academia, government, corporations, international organizations, and those who want to pursue careers in research and consultancy in environmental resource economics. At the end of two years of intensive training, the students are expected to have acquired a high degree of technical ability and a sound understanding of economic theory as it relates to environmental and natural resources.

## MSc (Environmental Studies and Resource Management)

This programme is intended to create a cadre of trained professionals who are equipped to deal with scientific, technological, legal, socio-economic, and policy aspects related to environment and resource management. The curriculum has been designed by seamlessly integrating the concept of sustainable development in an interdisciplinary framework. It addresses the growing need for professionals in the society who can apply best management practices drawn from various disciplines to create innovative solutions for a sustainable future. It aims to develop a holistic approach to environmental and resource problems in students from diverse academic, professional, and cultural backgrounds. The programme is designed with an emphasis on research and application.

### **Objectives**

- To provide fundamental knowledge of various components of environment and resource management.
- To foster inter-disciplinary approach by building scientific, technological, legal, economic, social, and policy perspective.
- To develop skills in relevant tools and techniques

- to assess the state of environment and carry out independent research.
- To enable application of knowledge for providing solutions in environment and resource management.

### **MSc (Geoinformatics)**

Studies on environmental and sustainable development issues require a huge amount of well-calibrated spatial and non-spatial datasets on the dynamics of natural and socio-economic systems. In order to meet the demand for qualified human resources who can contribute to production and analysis of these kind of datasets, TERI University offers a programme leading to the award of an MSc in Geoinformatics.

The programme educates students and professionals about project management related law and policy, apart from RS/GIS/GPS and modelling techniques. The programme also offers elective courses such as landscape ecology, integrated impact assessment, environmental modelling, watershed management, and climate change to understand the interdisciplinary applications of this tool.

### MSc (Plant Biotechnology)

The programme has been formulated with an objective of advancing education and research in the area of plant biotechnology with adequate attention to regulatory frameworks. The programme is one of its kind, with conceptual understanding imparted in cutting-edge areas of science, along with providing a preliminary exposure to regulatory issues and bioethical concerns. Emphasis is also laid on formal training in applied mathematics, statistics, and computational skills, keeping in mind the projected demand for a trained cadre adept at approaching biological problems in a truly inter-disciplinary and integral manner. Courses have been specifically structured to impart concepts pertaining to advanced areas of research in plant genomics and contemporary approaches employed by molecular biologists. Laboratory experimentation forms a major component of this programme, enabling students to acquire technical

proficiency. Therefore, a graduate of this programme may be expected to have both the specialized knowledge and practical experience required to creatively address contemporary problems in research and industry.

### **MTech (Renewable Energy Engineering** and Management)

With the world facing an energy crisis and the effects of climate change looming large, renewable energy studies and applications are set to play an extremely important role in any country. This has resulted in an increased demand for specialists and engineers in renewable energy. There are very few institutes in India that offer a structured programme to cover the diverse range of issues to meet this demand. This programme is intended to fill the gap and provide the much needed human resource capacity in renewable energy technologies and management. The programme is designed to train students not only in renewable energy technologies and implementation, but also in equally important areas of energy infrastructure, energy economics, energy conservation, energyenvironment interface, etc.

The objective of the MTech (REEM) programme is to prepare the students in theoretical as well as practical knowledge of renewable energy technologies and management. The programme is structured to enable them to tackle practical problems of design and development for industrial applications and to pursue academic research. The programme consists of core and elective courses taught during the first, second, and third semesters. In the final semester, the students are required to take up a major project either in an industrial establishment or at a research/consultancy organization dealing with renewable energy. This project is done as an independent study under the supervision of a faculty member at TERI University and a professional from some other organization.

### **MTech (Urban Development** and Management)

The complexities of managing sustainable development in urban areas of developing countries and globally, require an inter-disciplinary approach and expertise. While, on one hand, there is a severe shortage of professionals with techno-managerial skills required for these tasks, on the other hand, the requirement for the same is increasing rapidly.

The MTech Programme is designed to build a pool of competent professionals having required technical skills, managerial capabilities and understanding of social, economic, environmental, and legal issues associated with urban development, infrastructure, and real estate sector. The programme equips students for a successful career in:

- Urban local bodies, state governments, and other public sector institutions involved in delivery of urban infrastructure and services.
- Institutions conducting research, training, and capacitybuilding activities.
- Private sector organizations engaged in real estate and urban infrastructure development.
- Consultancy firms, NGOs, and CBOs participating in urban development activities.

The two-year programme MTech UDM, with four semesters, is structured to enable students from diverse backgrounds to grasp the contents of the programme through a year (Semesters 1 and 2) of course work at the University and a year (Semesters 3 and 4) of research project work.

# CONVOCATION 2014



### Sixth Convocation

The sixth convocation of TERI University was held on 5 February 2014.

The ceremony, held with much pomp and show, was conducted at the University campus in Vasant Kunj. The excitement amongst the graduands was palpable, and this contributed to the otherwise serious event.

Ambassador Hardeep Singh Puri, former permanent representative of India to the United Nations, was the Chief Guest at the convocation.

Honorary Doctorates were conferred on Mr Anshu Jain, Co-CEO, Deutsche Bank; Prof. Yuan Tseh Lee, Nobel Laureate; Mr Hemendra Kothari, Chairman, DSP Black

Rock Investment Managers Ltd; and Ms Shabana Azmi, Actor and Social Worker.

A total of 195 master's degrees and 10 doctoral degrees were conferred on the graduands.



### Medals for Standing First

### (Batch of 2013)

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Name	Stream
Vanita Godara	MSc (Environmental Studies)
Dina Nethisa Rasquinha	MSc (Natural Resources Management)
Pallavee Khanna	MSc (Water Resources Management)
Rumia Basu	MSc (Geoinformatics)
Sudeshna Maya Sen	MSc (Climate Science and Policy)
Sneha Sinha	MSc (Plant Biotechnology)
Bhawna Mangla	MSc (Economics)
Megha Anukampa Singh	MBA (Infrastructure)
Nidhi	MBA (Business Sustainability)
Aparna Sankar	MTech (Renewable Energy Engineering and Management)
Denise Fernandes	MA (Sustianable Development Practice)

# EMINENT GUEST LECTURES AT THE UNIVERSITY

Topic	Presenter	Date
LIDAR applications for natural resources management	Prof. Timothy G Gregoire, Yale University	8 August 2012
BSE Greenx indices	Mr Prakash Koushik and Mr Vivan Saran, BSE Index	22 August 2012
Sustainable development and the twenty first-century knowledge society	Dr R K Pachauri, Chancellor, TERI University	5 September 2012
S&P ESG India index and its performance	Dr Sunil Sinha, CRISIL India Ltd	12 September 2012
Sustainability and innovation	Sir Jonathon Porritt	10 October 2012
Numerical climate modelling in TERI's high performance computing	Dr Vidyunmala Veldor, TERI	26 October 2012
Emerging self-governance for sustainable global supply chains: Linking consumers in the North with suppliers in the South	Dr Walter J V Vermeulen, Utrecht University, The Netherlands	29 October 2012
India's national capital region: Growth prospects and challenges	Smt. Naini Jayaseelan, Member Secretary in National Capital Regional Planning Board	16 January 2013
Regulatory challenges in power sector	Mr Ashok Lavasa, Additional Secretary in the Ministry of Power	23 January 2013
Climate change and mitigation	Dr N J Singh, Director (EHS), DCM Shriram Consolidated Ltd	13 February 2013
Harnessing renewable energy: New technology solutions via large-scale energy storage?	Dr Sanjeev Mukerjee, Director in Northeastern University Center for Renewable Energy Technology, USA	21 February 2013
Understanding geo-economics	Dr Sanjaya Baru, Director for Geo-economics and Strategy, International Institute for Strategic Studies	27 February 2013
Swami Vivekananda's message to humanity and continuing relevance in today's times	Swami Prabhuddhananda Saraswati	20 March 2013

Topic	Presenter	Date
The clean energy economy: A way to global food security	HE Mr Olafur Ragnar Grimsson, The Hon'ble President of Iceland	4 April 2013
What's with the world? Exploration of new areas for the projects (Environment management, fly ash utilization, and thermal power plant operation)	Dr S K Dube, General Manager(AM)-Ex, Ash Management Division, NTPC Limited	17 April 2013
Risk, environment, and society	Dr Ravi Rajan	4 September 2013
Nuclear energy: Current status in India and abroad	Prof. R Rajaraman, Emeritus Professor of Physics, JNU	18 September 2013
Boom before bust? The industrial organization of groundwater	Prof. E Somanathan, ISI Delhi	25 September 2013

# INTERNATIONAL VISITING FACULTY AT TERI UNIVERSITY

### 2010 - 2014

### **Dr Susan Jickells**

Coordinator, Post Graduate Skills Training Coordinator, University of East Anglia, UK

### **Dr Cynthia Carliell-Marquet**

Senior Lecturer, University of Birmingham, UK

### Dr Zinaida Fadeeva

Associate Fellow, UNU-IAS, UNU-IAS, Japan

### Dr Carl Hoecke

Department of Natural Resources, University of Freiburg, Germany

### Ms Paivi Ahonen

Department of Policy Studies, University of Oulu, Finland

### Dr Heidi Hobbs

Associate Professor, Director, Master of International Studies, North Carolina State University, USA

### Prof. Gianni Vaggi

Professor of Economics, University of Pavia, Italy

### **Dr Gerry Luginbuhl**

Professor and Interim Department Head, Department of Microbiology, North Carolina State University, USA

### **Dr Vivek Fellner**

Associate Professor, Department of Animal Science, North Carolina State University, USA

### Dr Francis de los Reyes

Associate Professor, Civil Engineering, Department of Civil, Construction, and Environmental Engineering; North Carolina State University, USA

### **Dr Erin Sills**

Associate Professor and Director of International Programs, Department of Forestry and Environmental Resources, North Carolina State University, USA

### **Dr Robert Moog**

Associate Professor of Political Science, Department of Political Science and Public Administration, North Carolina State University, USA

### Dr David P Gilmartin

History Professor, North Carolina State University, USA

### **Dr Duarte B Morais**

Associate Professor; Parks, Recreation, and Tourism Management; Associate Professor, North Carolina State University, USA

### Dr Nitya Rao

Senior Lecturer, Gender Analysis and Development, School of International Development, University of East Anglia, UK

### Dr Vasudha Chottray

Lecturer in Development Studies, School of International Development, University of East Anglia, UK

### Dr Anil Markandya

Scientific Director of BC3, Basque Center for Climate Change, Spain

### Prof. Timothy G Gregoire

Professor of Forest Management, Yale School of Forestry and Environmental Studies, USA

### Dr Karen C Seto

Associate Professor, Urban Environment, Yale School of Forestry and Environmental Studies, USA

### Prof. Ravi Rajan

Sr Research Fellow, University of California, USA

### Dr Rajan Kotru

Research Scholar, International Centre for Integrated Mountain Development, Nepal

### Dr Kirsten Jorgenson

Professor FFU, Free University of Berlin, Germany

### **Prof. Michel Aragno**

Honorary Professor, Institute of Biology, Switzerland

### Dr Floris van den Berg

Faculty of Geosciences, Utrecht University, The Netherlands

### **Dr Ilan Chabay**

Senior Fellow, Institute for Advanced Sustainability Studies, Potsdam, Germany

### Dr Michel D S Mesquita

Bjerknes Centre for Climate Research, Norway

### Dr Erika Das

University of Iceland

### **Prof. Kimio Uno**

Keio University

### Dr Diana Reckien

Postdam Institute for Climate Impact Research, Germany

# STUDENT EXCHANGE

### Freie University of Berlin, Germany

1.	Richa Sharma, MSc (Water Resource Management)	2012-2013
2.	<b>Shipra Rajesh</b> , Doctoral student (Natural Resource Management)	2012-2013
3.	<b>Gopal K Sarangi</b> , Doctoral student (Regulatory and Policy Issues)	2011–2012
4.	Arnab Mandal, MA (Sustainable Development Practice)	2011–2012
5.	Divya M Sharma, MSc (Climate Science and Policy)	2011–2012
6.	Neena Sekharan, MBA (Business Sustainability)	2011–2012
7.	Deepak Sharma, MBA (Infrastructure)	2010-2011
8.	Drishya Nair, MSc (Climate Science and Policy)	2010-2011
9.	Pallavi Sharma, MSc (Climate Science and Policy)	2010-2011
10.	Pranay Ranjan, MSc (Environmental Studies)	2009–2010
11.	Niharika Krishna, MSc (Environmental Studies)	2009–2010
12.	Romita Roshan Pandita, MSc (Natural Resource Management)	2009–2010
13.	Vaishali, Doctoral student	2009-2010

### University of Freiburg, Germany

1.	Niyati Naudiyal, MSc (Environmental Studies)	2011–2012
2.	Anjana Srimathi, MSc (Environmental Studies)	2011-2012
3.	<b>Thanggoumang Hangsing</b> , MSc (Natural Resource Management)	2011-2012

### Yale University, USA

1.	Parul Gupta, MSc (Economics)	2010-2011
2.	Rahul Sharma, MTech (REEM)	2010-2011
3.	Ritika Tewari, MSc (Natural Resource Management)	2010-2011
4.	Marianne Manuel, MSc (Environmental Studies)	2010–2011
5.	Poorva Harbola, MSc (Geoinformatics)	2010-2011
6.	Divya Gupta, MSc (Water Resource Management)	2010-2011
7.	Deepa Maggo, MSc (Natural Resource Management)	2009–2010
8.	Supriya Gulati, MSc (Natural Resource Management)	2009–2010
9.	<b>Rudresh Kumar Sugam</b> , MSc (Water Resource Management)	2009–2010
10.	Chinchak, MSc (Water Resource Management)	2009–2010
11.	Neeraj Garg Baruah, MSc (Geoinformatics)	2009–2010
12.	Pallavi Pant, MSc (Environmental Studies)	2008-2009
13.	Avipsa Mahapatra, MSc (Natural Resources Management)	2008-2009

# RECRUITERS AT TERI UNIVERSITY

**ACC Ltd** 

**Aid-Matrix Foundation India** 

**Ambuja Cement Ltd** 

**American India Foundation on Micro Insurance** 

**Applied Environmental Research Foundation** 

**Asian Consulting Engineers Pvt. Ltd** 

**Association for Stimulating Know How** 

**ATREE** 

**Bank of America** 

**Bharat Petroleum Corporation Ltd** 

**Bombay Natural History Society** 

**Boston Strategies** 

Capital IQ

**Centre for Science and Environment** 

**Centre for Advancement of Sustainable Agriculture** 

**Centre for Budget Governance and Accountability** 

**Centre for Civil Society** 

Centre for Wildlife

**Centre for Development Studies** 

Chego

CII-ITC Centre of Excellence for Sustainable

Development

**Cooperative Rural Development Trust** 

**Cotton Connect** 

**CRISIL Research** 

**CUTS International** 

**Dakshin Foundation** 

**Defence Research and Development Organisation** 

(Snow and Avalanche Study Establishment)

Delhi School of Economics, University of Delhi

Department of Commerce, Government of India

**Development Alternatives** 

Delhi Public School, R K Puram New Delhi

Eco Securities India Pvt. Ltd

**Eicher Motors Ltd** 

**Emergent Ventures** 

**Equitable Tourism Options** 

**Ernst & Young** 

**ESRI India** 

**Ethiopia** 

**ETI Dynamics** 

**Evolution Capital Partners** 

**Family Health International** 

Federation of Indian Chambers of Commerce

and Industry

**Financial Information Network & Operations Ltd** 

**Fortress Financial Services** 

**Foundation for Ecological Security** 

Gargi College, University of Delhi

**Gas Authority of India Ltd** 

**Gene Campaign** 

**Gensol Consultants** 

**GIZ** India

**Golder Associates** 

**Grass Roots Research and Creations** 

**GreenBandhu EcoSolutions** 

**Green Foundation** 

**Greenpeace India** 

**Greentech Knowledge Solution** 

**Group Concorde** 

**Gujarat Ecological Education and** 

**Research Foundation** 

HERE, Nokia

**Hindalco Industries Ltd** 

**Hindustan Petroleum Corporation Ltd** 

**ICF** International

**ICIMOD Nepal** 

**ICRA Management Consulting Services Ltd** 

**IL&FS Enviro** 

**India Development Foundation** 

**India Energy Exchange** 

India Infrastructure Publishing Pvt. Ltd

India Petro Group

Indian Agricultural Research Institute

Indian Institute of Foreign Trade

Indian Institute of Human Settlement

**Indian Institute of Sciences** 

Indian Institute of Technology, Delhi

**Indian Institutes of Science Education** 

and Research

**Indian Oil Corporation Ltd** 

**Indian Petro Group** 

**Indian Space Research Organisation** 

**Indian Statistical institute** 

Infosvs

**Inox Wind** 

Institute for Competitiveness, India

Institute of Rural Management, Anand

Institute of Rural Research and Development

International Council for Local Environmental

Initiatives

International Food Policy Research Institute

**International Water Management Institute** 

**IPSOS** 

**IT Power** 

ITC Ltd

Ivorysands Infrastructure & Hospitality Pvt. Ltd

Jawaharlal Nehru University

Jawaharlal Nehru Centre for Advanced

Scientific Research

JM Environet

**Jubilant Industries** 

Kalpavriksh

**KBS Certification Services** 

**KPMG** India

### **Larsen & Toubro**

**Maharashtra Association of Anthropological** 

**Sciences** 

Maps of India, New Delhi

**Ministry of Corporate Affairs** 

**Ministry of Finance** 

**National Council of Applied Economic Research** 

National Institute of Oceanography

**National Skill Development Corporation** 

**Nutrition Foundation of India** 

### Oil and Natural Gas Corporation Oil India Ltd

**PATH** 

PCI Geomatica, New Delhi

**Pitney Bowers India** 

**Planning Commission of India** 

**Pravah** 

**PricewaterhouseCoopers** 

Prometheus Infotech Pvt. Ltd

Public Health Foundation of India

Rajasthan Livelihood Mission, Ministry of Rural

**Development** 

Ramky Enviro Engineers Pvt. Ltd

**Reliance BIJ Foundation** 

Research and Information System for Developing

**Countries** 

RMSI, New Delhi

**S N Power Markets** 

Science and Technology Park, University of Pune

SGS India Pvt. Ltd

Shakti Sustainable Energy Foundation

SIGMA Research, New Delhi

SMS Envocare Ltd

South Asia Consortium for Interdisciplinary Water

**Resources Studies** 

**Spatial Decisions** 

Srijan

**Tata Consultancy Services** 

**Tata Power** 

**TERI University** 

The Energy and Resources Institute

The Institute of Economic Growth

### Vasudha Foundation

Wetlands

Wildlife Trust of India

Wipro Eco Energy

**World Energy Council** 

**World Institute of Sustainable Energy** 

World Wildlife Fund India

### Yale University

# ONGOING RESEARCH PROJECTS

	Ongo	oing Research Pl	rojects : TERI Unive	Ongoing Research Projects : TERI University as on 30.09.2013	3	
Project Title	Molecular and morphological characterization of Brassica transgenic lines with augmented expression of FT and generation of Brassica transgenic lines with reduced FT expressions for delayed flowering	Land-use related biodiversity in India	Helicobacter pylori phospholipases as novel virulence factors	Satellite-based analysis for assessing status of urban ecosystems and urban heat island phenomena in metropolitan cities of India	Decentralized offgrid electricity generation in developing countries: Business models for offgrid electricity supply	Evaluation and optimization of osmotolerant environmental microbial isolates for the production of bioethanol from xylose in lignocellulosic waste
Sponsor	Department of Biotechnology	The Institute of Silviculture	Department of Biotechnology	Department of Science and Technology	Engineering and Physical Sciences Research Council	Department of Biotechnology
Objective	Screening of TI segregants harboring 35SCaMV Brassica FT on Kanamycin containing media and transferring an appropriate number of TI lines at National Phytotron Facility, IARI, Pusa	Conducting one course in vegetation science in India	Helicobacter pylori phospholipases as novel virulence factors	SERC fast track proposals for Young Scientists Project 2009-10 from the Ministry of Science and Technology for urban ecosystems	Decentralized offgrid electricity generation in developing countries: Business models for offgrid electricity supply	Biological characterization of xylose degarding environmental microbial isolates
Project Abbr. Title	FT expressions for delayed flowering	Land use related biodiversity in India	<i>Helicobacter</i> <i>pylori</i> phospho- lipases	Urban Ecosystems and Urban Heat Island	University of Dundee project	Bioethanol produciton from xylose
PI Name	Dr Anandita Singh	Dr Joachim Michael Schmerbeck	Dr Ramakrishnan Sitaraman	Dr Pawan Kumar Joshi Dr Arabinda Mishra	Dr Arabinda Mishra	Dr Ramakrishnan Sitaraman
Sanction Date	30-Sep-11	8-Sep-11	11-Nov-11	9-Sep-09	25-Jun-09	11-Feb-11
Project Start	30-Sep-11	8-Sep-11	11-Nov-11	9-Sep-09	1-Jul-09	11-Feb-11
Project End	31-Aug-14	8-Sep-14	10-Nov-14	31-Mar-14	30-Jun-14	11-Mar-14
Area Desc.	Department of Biotechnology	Dept. of Natural Resources	Department of Biotechnology	Department of Natural Resources	Department of Energy and Environment	Department of Biotechnology
Status	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Proj. Cat. Desc.	Research	Research	Research	Research	Research	Research

		Ongoing	Research Proje	cts : TERI Univer	Ongoing Research Projects : TERI University as on 30.09.2013		
Project Title	Building an inventory of energy subsidies	Resilience of the financial sector against external and internal shocks: Comparative study of selected SAARC economies	Targeting low-arsenic and low-fluoride groundwater to reduce exposure in rural Punjab, India	Indian-European Multilevel Climate Governance Research Networking (MCGRN)	Development of a knowledge-based decision tool to simulate mechanism of vegetation change due to climate change in Western Himalayan Ecoregion (part of Uttarakhand)	Analysing the implementation of Forest Rights Act, 2006: A cultural political study of community rights in southern Rajasthan	DBT Network project on development and stress specific genomics of small non-coding RNAs in <i>Brassica sp.</i> rice and wheat: Phase 2
Sponsor	International Institute for Sustainable Development	South Asia Network of Economic Research Institutes	United States Agency for International Development	Indian Council of Social Science Research	Ministry of Environment and Forests	Indian Council of Social Science Research	Department of Biotechnology
Objective	Assessment and Implications of Rationalizing Fossil-Fuel Subsidies (ADBTA 7834): Analytical Framework v1		Targeting low-arsenic and low-fluoride groundwater to reduce exposure in rural Punjab, India			Analysing the implementation of forest rights act (2006): A cultural political study of community rights in southern Rajasthan	DBT Network project on development and stress specific genomics of small non-coding RNAs in Brassica sp. rice and wheat phase 2
Project Abbr. Title	Inventory of energy subsidies	SANEI Study	Low-arsenic and low-fluoride groundwater	Indian-European Research Networking	MoEF project in Himalayan Ecoregion	Rajasthan Forest rights act analysing	Rice and Wheat phase 2
PI Name	Dr Kaushik Ranjan Bandyopadhyay	Dr Subir Sen	Mr Chander Kumar Singh	Mr Gopal Krishna Sarangi	Dr Pawan Kumar Joshi	Ms Smriti Das	Dr Anandita Singh
Sanction Date	15-Apr-13	1-Mar-13	26-Aug-13	24-Jan-13	17-Apr-12	10-Mar-12	23-Mar-12
Project Start	1-May-13	1-Apr-13	27-Aug-13	1-0ct-13	1-May-12	1-Jun-12	23-Mar-12
Project End	30-Sep-13	31-Mar-14	27-Aug-14	30-Sep-16	30-Apr-15	30-Nov-13	22-Mar-15
Area Desc.	Department of Business Sustainability	Department of Business Sustainability	Department of Natural Resources	Department of Policy Studies	Department of Natural Resources	Centre of Regulatory and Policy Research	Centre of Bioresources and Biotechnology
Status	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Proj. Cat. Desc.	Research	Research	Research	Research	Research	Research	Research

# LIST OF PUBLICATIONS

(1 July 2012 to 30 June 2013)

# DEPARTMENT OF NATURAL RESOURCES

### Dr Prateek Sharma

Fostering Sustainability through Education, Research and Practice: A Case Study of TERI University Jain S, Aggarwal P, Sharma N, **Sharma P** *Journal of Cleaner Production*, doi:10.1016/j. jclepro.2013.04.021 (2013)

Response to Discussion on 'An Integrated Statistical Approach for Evaluating the Exceedance of Criteria Pollutants in the Ambient Air of Megacity Delhi' Sharma P, **Sharma P**, Jain S, Kumar P *Atmospheric Environment*, 71: 413–414 (2013)

Can 'Blue Sky' Return over in Indian Megacities? Kumar P, Jain S, Gurjar BR, **Sharma P**, Khare M, Morawska L, Britter R

Atmospheric Environment, 71: 1–4 (2013)

An Integrated Statistical Approach for Evaluating the Exceedance of Criteria Pollutants in the Ambient Air of Megacity Delhi

Sharma P, **Sharma P**, Jain S, Kumar P *Atmospheric Environment,* 70: 7–17 (2013)

Sustainable Energy Management for a City Aggarwal A, Rai V, **Sharma P** *JA Journal of Architecture*, 1(2): 76–80 (2012)

Review of Methods to Develop Indicators of Sustainable Development
Kwatra S, Kumar A, **Sharma P**In — *Proceedings of the International Conference on Sustainable Development and Governance: Building Commerce and Communities*,
Amrita University, India, Section VII,
pp. 285–303 (2012)

### Dr Joachim Schmerbeck

Can Development Interventions Reduce Human Pressure on Forest? A Case Study of a Long-term Observation in India

**Schmerbeck J**, Pouyet J, Patnaikc S In, Tropentag 2012, Göttingen, Germany, 19–21 September (2012)

Regeneration of Plant Communities under the Canopy of *Prosopis juliflora* in Delhi Srimati A, **Schmerbeck J**, Gärtner S In — *Land-use Related Biodiversity in India: Seminar Proceedings*, TERI University, New Delhi, 25 August (2012)

Regeneration of Shola Tree Species under Eucalyptus Plantations in Upper Palni Hills Naudiyal N, **Schmerbeck J**, and Gärtner S In — *Land-use Related Biodiversity in India: Seminar Proceedings*, TERI University, New Delhi, 25 August (2012)

Land-use Related Biodiversity in India: Seminar Proceedings Naudiyal N, **Schmerbeck J**, Kumar N (eds) (2013) TERI University, New Delhi, 25 August (2012)

Can Development Interventions Reduce Human Pressure on Forest? A Case Study of a Long-term Observation in India

**Schmerbeck J**, Pouyet J, Patnaik S (eds) (2012), Conference Proceeding, Tropentag 2012, Göttingen, Germany, 19–21 September (2012)

### Dr Suresh Jain

Size Resolved Characterization of Aerosols and Thermal Efficiency of Traditional and Improved Cookstoves for Different Wood Biomass

Arora P, **Jain S**, Sachdeva K Accepted in — *Energy for Sustainable Development*, doi.org/10.1016/j.esd.2013.06.003 (2003) New Directions: Can 'Blue Sky' Return over in Indian Megacities?

Kumar P, Jain S, Gurjar B R, Sharma P, Khare M, Morawska L, Britter R

Atmospheric Environment, 71: 1–4 (2013)

An Integrated Statistical Approach for Evaluating the Exceedance of Criteria Pollutants in the Ambient Air of Megacity Delhi

Sharma P, Sharma P, Jain S, Kumar P Atmospheric Environment, 70: 7–17 (2013)

Fostering Sustainability through Education, Research and Practice: A Case Study of TERI University Jain S, Aggarwal P, Sharma N, Sharma P Journal of Cleaner Production, doi: 10.1016/j. jclepro.2013.04.021 (2013)

Response to Discussion on 'An Integrated Statistical Approach for Evaluating the Exceedance of Criteria Pollutants in the Ambient Air of Megacity Delhi' Sharma P, Sharma P, Jain S, Kumar P **Atmospheric Environment,** 71: 413–414 (2013)

A Review of Environmental and Economic Impacts of Thermal Power Plants Using Life Cycle Assessment Agrawal K, Jain S, Jain A K, Roy H *UPES Management Review*, 2: 13–22 (2012)

Predicting Violations of National Ambient Air Quality Standards Using Extreme Value Theory for Delhi City Sharma P, Chandra A, Kaushik S C, Sharma P, Jain S Journal of Atmospheric Pollution Research, 3: 170-179 (2012)

Application of Life Cycle Assessment in Identifying and Reducing Environmental Impacts of Thermal Power Plants in India

Agrawal K K, **Jain S**, and Jain A K Journal of Management Research 1(1): 128–139 (2013)

### Dr Anu Rani Sharma

Influence of Land Use/Land Cover Changes on Atmospheric Dynamics over the Arid Region of Rajasthan State, India Kharol S K, Kaskaoutis D G, Badarinath K V S, Sharma A R, and Singh R P Journal of Arid Environments, 88: 90–101 (2013)

The Impact Assessment of Diwali Fireworks Emissions on the Air Quality of a Tropical Urban Site, Hyderabad, India, during Three Consecutive Years Swamy Y V, **Sharma A R**, Nikhil G N, Venkanna R, Chaitanya D S N K, Sinha P R **Environment Monitoring and Assessment**, doi 10.1007/s10661-013-3102-x (2013)

## DEPARTMENT OF **BIOTECHNOLOGY**

### Dr Ramakrishnan Sitaraman

Cell-associated Hemolysis Induced by Helicobacter pylori is Mediated by Phospholipases with MAPKactivating Properties

Sitaraman R, Israel D A, Romero-Gallo J, Peek R M *Journal of Clinical Microbiology*, 50: 1014–1018 (2012)

## Dr Anandita Singh

Functional Analysis of Splice Variant Expression of Mads Affecting Flowering 2 of Arabidopsis thaliana Rosloski S M, Singh A, Jali S S, Balasubramanian S, Weigel D, Grbic V

*Plant Molecular Biology*. 81: 57–69 (2013)

### DEPARTMENT OF BUSINESS SUSTAINABII ITY

## Prof. Manipadma Datta

Principles of Responsible Investments and Environmental

Social and Governance Issues: The Emerging Horizon of Sustainability-based Decision Making in finance

The Chartered Secretary, XLIII(3) March (2013)

Risk Aggregation and Reporting: Basel Committee Principles towards Sustainable Banking The Chartered Secretary XLIII(8) August (2013)

Business and Changing Climate: A Commentary on the Evolution of Regulatory Framework in India Jointly authored with R Sinha

AIMS International Journal of Management (accepted)

Environmental, Social, and Governance Challenges to Business: The Emerging Paradigm in Managing Risks Jointly authored with Ria Sinha

The Indian Accounting Review (accepted)

## Dr Kaushik Ranjan Bandyopadhyay

Biofuels in South Asia: Food Security Challenges and Beyond

#### Bandyopadhyay K R, K Das

Discussion Paper, South Asia Watch for Trade Economics and Environment (SAWTEE) (2013)

**Energy Security** 

#### Bandyopadhyay K R

In — South Asia Development and Cooperation Report: Research and Information System for **Developing Countries** 

New Delhi: Oxford University Press (forthcoming)

Automobiles in India and China

Bandyopadhyay K R, A Arora Berkshire Encyclopedia of Sustainability: China, India, and East and Southeast Asia USA: Berkshire Publishing (2012)

## DEPARTMENT OF **POLICY STUDIES**

## Dr Shaleen Singhal

An Evaluative Model for City Competitiveness: Application to UK Cities

Shaleen S, Stanley MG, Jim B

Land Use Policy, 30: 214–222 (2013)

Journal home page: www.elsevier.com/locate/landusepol

Application of a Hierarchical Model for City Competitiveness in Cities of India

Shaleen S, Stanley MG, Jim B

Cities, 31: 114–122 (2013)

Journal homepage: www.elsevier.com/locate/cities

### Dr Poornima Varma

Trade Creation and Trade Diversion in the India-Sri Lanka Free Trade Agreement: A Sector Specific Analysis Choudhry Sonam, Murali Kallumal, Varma P *Journal of Economic Policy and Research*, 8(1) (2013)

South Asian Exports of Agricultural Products to European Union and the Role of SPS Standards Related to Border Restrictions: An Analysis of the RASFF Murali Kallummal, Aditi Gupta, and Varma P *Journal of Economic Policy and Research*, 8(2) (2013)

India's Marginal Intra-Industry Trade in Selected Agricultural and Processed Food Products: The Likely Implications on Adjustment Costs and Food Security

#### Varma P

Journal of Resources, Energy and Development, **10**(1) (2013)

An Analysis of India's Bilateral Intra-Industry Trade in Agricultural Products

#### Varma P

International Journal of Economics and **Business Research (IJEBR)** 4(1–2) (2012)

Do Free Trade Agreements Promote Intra Industry Trade: An Analysis for India and Its FTAs? Anjali R, Varma P

International Journal of Trade and Global Markets (Forthcoming)

Doha Sectoral Negotiations: A Study on Healthcare Sector in India Verma R, Kallumma M, Varma P Foreign Trade Review, 48(3) (Forthcoming)

### Dr Kavita Sardana

The Realized Yield Effect of GM Crops: US Maize and Soybean Zheng X, David D A, **Sardana K**, Carlo MG Crop Science (accepted)

## Mr M V Shiju

A Nuclear Liability Framework for South Asia: Formation of South Asian Association for Regional Cooperation (SAARC) Nuclear Risk Community RamMohan M P, Raju K D, **Shiju M V** *International Journal of Nuclear Law* 4(1) (2012)

Competition Issue in Public Procurement (Monograph) Gaurang D, Nanda N, and Shiju M V New Delhi: TERI Press (2012)

## PATENTS FILED

## **INVENTOR**

## Dr Ramakrishnan Sitaraman

- 1. Improved bacterial host for production of Anthrax toxin proteins and vaccines: Bacillus anthracis BH450. Federal Register (August 21, 2007) 72(161): 46643
- 2. Patent application for a method for rapid screening of cultures for reducing ability using methylene blue (Application Ref. No. INR49383/AB)
- 3. Patent application for a method for the reliable preservation of microbial cultures isolated from the environment (Application Ref. No. INR49384/AB)

## HONORARY DOCTORATE DEGREES AWARDED

#### Convocation 2014

Mr Anshu Jain, Co-CEO, Deutsche Bank Prof. Yuan Tseh Lee, Nobel Laureate Mr Hemendra Kothari, Chairman, DSP BlackRock Investment Managers Ltd Ms Shabana Azmi, Actor and Social Worker

#### Convocation 2013

Mr Bhupinder Singh Hooda, Chief Minister of Haryana Prof. Carlo Rubbia, Scientific Director, Institute for Advanced Sustainability Studies, Germany Mr Nassir Abdulaziz Al-Nasser, President of the UN General Assembly Mr Sam Pitroda, Advisor to Prime Minister of India Mr Thomas Lauren Friedman, Foreign Affairs Columnist, The New York Times Mr Zhang Yue, Chairman of the Broad Group

#### Convocation 2012

**HE Mr James Alix Michel**, President, Republic of Seychelles HE Mr Bharrat Jagdeo, Former President, Republic of Guyana HE Mr Erik Solheim, Minister of Environment and Minister of Development Co-operation, Kingdom of Norway **Prof. Elinor Ostrom**, Distinguished Professor, Indiana University Ms Naina Lal Kidwai, Group General Manager and Country Head, HSBC Group in India

### Convocation 2010

Mr Tejendra Khanna, Lieutenant Governor of Delhi Dr Sultan Ahmed Al Jaber, Managing Director and Chief Executive Officer of Masdar Dr Kandeh K Yumkella, Director-General, United Nations Industrial Development Organization

### Convocation 2006

Mr Nandan Nilekani, Chief Executive Officer and Managing Director, Infosys Technologies Limited

## DOCTORAL DEGREES AWARDED

S. no.	Name of the student	Supervisor's name	Title of PhD thesis
1	Dhruva Bhattacharya	Dr Banwari Lal	Genetic diversity among petroleum hydrocarbon degrading bacteria isolated from crude oil and oily sludge contaminated sites
2	Neeti Chauhan	Dr Malathi Lakshmikumaran	Genome analysis of <i>Populus sp.</i> : Assessment of genetic diversity of <i>P. deltoides</i> , characterization of wide hybrids and phylogenetic analysis using molecular markers
3	Kadambari Gupta	Dr Abha Agnihotri	Evaluation of <i>Brassica juncea</i> (L.) Czern x B. rapa/B. carinata hybrids and their advanced progenies against two major fungal diseases: Molecular, morphological and biochemical characterization
4	Vanit Kathuria	Dr Nutan Kaushik	Evaluation of biological activity of various plants species against Helicoverpa armigera (Hübner)
5	Prasun Ray	Dr Alok Adholeya	Selection and characterization of suitable ectomycorrhizal isolates for application in heavy metal polluted sites
6	Vaishali Sabharwal	Dr Malathi Lakshmikumaran	Studies on the genome organization of <i>Brassica juncea</i> [(L.) Czern & Coss]
7	Priyangshu M Sarma	Dr Banwari Lal	Assessment and documentation of bacterial diversity at the sites contaminated with petroleum hydrocarbons: A polyphasic approach
8	Deepak Prem	Dr Abha Agnihotri	Induction of genetic variability for agro-morphological and biochemical traits in Indian mustard [ <i>Brassica juncea</i> (L.) Czern and Coss] through chemical mutagenesis in conjugation with doubled haploid technology
9	Pooja Joshi	Dr Vibha Dhawan	Biotechnological interventions for multiplication and conservation of <i>Swertia chirayita</i> (Roxb. Ex Fleming) H. Karst
10	Venkatesh Dutta	Dr Leena Srivastava	Preference heterogeneity, public choice, and willingness to pay: Study of water supply reform in a mega city
11	Nirmal Kumar Saha	Dr Malini Balakrishnan	Characterization and control of membrane fouling in sugarcane juice ultrafiltration
12	Deepak Pant	Dr Alok Adholeya	Microbial decolorization of distillery effluent for its application in wasteland reclamation
13	Sonali Patle	Dr Banwari Lal	Investigation of potential of agro-industrial residues for ethanol production by using <i>Candida tropicalis</i> and <i>Zymomonas mobilis</i>
14	Nishritha Bopana	Dr Sanjay Saxena	Micropropagation for conservation of two economically important medicinal plant species: <i>Asparagus racemosus</i> (Willd.) and <i>Crataeva magna</i> (Lour.) DC.
15	S Krishnan	Dr Banwari Lal	Studies on C-S bond targeted biodesulphurization of middle-distillate range fuels by <i>Mycobacterium phlei</i> SM120-1

S. no.	Name of the student	Supervisor's name	Title of PhD thesis
16	Yamini Satyawali	Dr Malini Balakrishnan	Integrated physico-chemical and biological process for treatment of alcohol distillery wastewater
17	Anand Prakash Tiwari	Dr Leena Srivastava	Choice and preference of water supply institutions: Analysing expert, stakeholder, and consumer preferences for reforms in developing city of Delhi
18	Srivalli Krishnan	Dr Sanjay Saxena	Genetic transformation of <i>Carica papaya</i> L. Indian cultivar CO7
19	Nitu Sood	Dr Banwari Lal	Microbial interventions for the mitigation of paraffin deposition problems and remediation of acidic oily sludge
20	Akhil Agrawal	Dr Banwari Lal	Diversity and abundance of sulfate-reducing bacteria in oil fields of India
21	Ritu Paliwal	Dr Leena Srivastava	Policy intervention analysis: Adequacy of post project monitoring process in India and barriers to its effective implementation
22	Sangeeta Sen	Dr Vibha Dhawan	Production of disease free and superior planting material of Citrus through biotechnological approaches
23	Guneet Kaur	Dr Banwari Lal	Assessment of thermophilic sulfate reducing bacterial diversity in Indian oil reservoirs and their control
24	Shilpanjali Deshpande	Dr Banwari Lal	Studies on the degradation of the insecticide Endosulfan by indigenous bacterial strains
25	Snigdha Sushil	Dr Vidya S Batra	Activity of red mud-based materials in decomposition and oxidation reactions
26	K Usha Rao	Dr V V N Kishore	Diffusion modelling of selected renewable energy technologies, products, and applications in India
27	S K Joshi	Dr Surender Kumar	Intergovernmental fiscal transfers and the environment: A study of India
28	Hema Patel	Dr Suneel Pandey	Management of chemical sludge generated from textile waste water treatment plants
29	Nemika Relhan	Dr T S Panwar	Health impacts of air pollutants from coal
30	Harshita Pathak	Dr Vibha Dhawan	Biotechnological interventions for the production of superior, disease-free planting material of apple ( <i>Malus X domestica</i> Borkh.) rootstocks
31	Simrita Cheema	Dr Banwari Lal	Metagenomic approach to study the polyhydroxyalkanoate gene from hydrocarbon contaminated site
32	Jyotsana Dalal	Dr Banwari Lal	Enhanced synthesis of polyhydroxyalkanoates (PHA) from bacterial strains for production of biodegradable plastics
33	Ashu Mamgain	Dr Pradhan Parth Sarthi	Study of snow-monsoon relationship and changes in rainfall and temperature characteristics in India

S. no.	Name of the student	Supervisor's name	Title of PhD thesis
34	Seema Sharma	Dr Alok Adholeya	Selection of hyper accumulator microorganisms and plants for bioextraction of chromium from tannery sludge and effluent
35	Prakashkiran Suryakant Pawar	Dr Alok Adholeya	Comprehensive analysis of evapotranspiration estimation methods and modelling actual evapotranspiration of maize ( <i>Zea mays</i> , L) crop under water deficient conditions for drought proofing and water savings in agriculture
36	Susmita Sahu	Dr Ligia Noronha	Mangrove fishery ecosystem in Bhitarkanika: A bio-socio- economic analysis
37	Nishant	Prof P K Joshi	Assessment of real estate attributes for catastrophe insurance (property estimate) using geospatial techniques
38	Jami Hossain	Prof V V N Kishore	A GIS-based approach to reassessment of potential for wind energy utilization in India
39	Susheel Kumar	Dr Nutan Kaushik	Bioprospecting of endophytic fungi for fungicidal activity
40	Anshul Puri	Dr Alok Adholeya	Development of Next Generation Symbiosis with Ecto and Endo – Mycorrhizal Fungi on Ri T-DNA transformed hairy roots
41	Chandrashekhar Deshmukh	Dr Arun Kansal	Greenhouse gas emissions (CH4,CO2 and N2O) from a newly flooded hydroelectric reservoir in subtropical South Asia: The case of Nam Theun 2 Reservoir, Lao PDR
42	Deepshikha Sharma	Dr Arun Kansal	Evaluation of river quality restoration plan and intervention analysis using water quality modelling with focus on the River Yamuna, Delhi (India)
43	Divya Negi	Dr Sanjay Saxena	Micropropagation of two economically important species of bamboos: <i>Bambusa balcooa</i> Roxb. and <i>Bambusa nutans</i> Wall. Ex Munro
44	Sanjeev Kumar	Dr Alok Adholeya	Partial sequencing and molecular phylogeny of Arbuscular Mycorrhizal Fungi using SSU-ITS and LSU rRNA gene
45	Neena Priyanka	Prof P K Joshi	Economical niche modeling framework for mapping Lantana camara invasion risk potential under climate and anthropogenic changes
46	Richa Sharma	Prof P K Joshi	Development and behaviour of Surface Urban Heat Island (SUHI) in semi-arid conditions of Delhi
47	Aditi Banerji	Dr Malini Balakrishnan	Pre-treatment of agro-residues for the production of fermentable sugars
48	Aniruddha Ghosh	Prof P K Joshi	Framework to unify sensor information for observing nature (FUSION): Selected earth observation applications using remote sensing data

## ONGOING DOCTORAL RESEARCH

S. no.	Name of the student	Supervisor's name	Topic of research
1	Mr Prasant Kumar	Dr Arabinda Mishra	Study of NTFP heterogeneity vis-à-vis forest management and livelihood improvement in communities living in and around forests in Madhya Pradesh
2	Ms Aditi Banerji	Dr Malini Balakrishnan	Evaluation of selected pre-treatment processes for clean fractionation and enzymatic saccharification of lignocellulosics
3	Ms Savita Rakhra	Dr Subir Sen	Environmental measures and its effect on export sector
4	Mr Gopal K Sarangi	Dr Arabinda Mishra	Retail electricity pricing in developing economies: Case of Indian power markets
5	Ms Sudha K Shrotria	Prof. S Sundar	Environmental and human rights: An analytical study of the role and performance of the National Human Rights Commission of India in addressing environmental issues from a human rights perspective
6	Mr Manish Kumar Baghla	Dr Kaushik Ranjan Bandyopadhyay	Impact assessment of petroleum products (petrol, diesel, LPG, and kerosene) price regime in India: Equity, efficiency, and revenue considerations
7	Ms Sima Kumari	Dr Alok Adholeya	Evaluation role of mycorrhizal biofilm in a model system of AMF axenic culture <i>in vitro</i>
8	Ms Monika Saini	Dr P K Joshi	GIS-based integrated social-hydrological-environmental modelling applicable to watersheds in India
9	Ms Pratiksha R Mayee	Dr Anandita Singh	Molecular and functional characterization of FT and SOC1 for Modulation of flowering in <i>Brassica sp.</i>
10	Ms Neelam Singh	Dr Prateek Sharma	Investigating the role of environmental management system (EMS) including the concept of total quality environmental management (TQEM) in India
11	Mr Navarun Varma	Dr Arabinda Mishra	Vulnerability and climate adaptation
12	Mr A K Joshi	Dr P K Joshi	Change in resource utilization pattern and its impact on forest ecosystems in lesser Himalaya
13	Mr Shyam Sunder Sharma	Dr Shashi Bhushan Tripathi	Identification and molecular characterization of superior genotypes of <i>Pongamia pinnata</i> for increased biodiesel production
14	Ms Shivakshi Jasrotia	Dr Arun Kansal	Application of solar still for arsenic removal in rural drinking water supplies

S. no.	Name of the student	Supervisor's name	Topic of research
15	Ms Kanika Chowdhary	Dr Nutan Kaushik	Bioprospecting of endophytic fungi isolated from Indian medicinal plant
16	Ms Pratima Sinha	Dr Shashi Bhushan Tripathi	Development of molecular tools and genetic stocks for marker assisted germplasm improvement of <i>Jatropha curcas</i>
17	Mr Shivaraj S M	Dr Anandita Singh	Chracterization of microNA genes in Brassica
18	Ms Priyanka Dhakate	Dr Anandita Singh	Genomic strategies for modulating fruit and flower development in Brassicas
19	Ms Neena Priyanka	Dr P K Joshi	Ecological niche framework for modelling <i>Lantana camara</i> invasion risk potential under climate and anthropogenic changes
20	Ms Vrishali Ramkrishna Chaudhari	Dr Arabinda Mishra	Role of institutional interplay in performance of local-level resource management institutions in the context of global environmental change
21	Ms Madhuben Sharma	Dr Prateek Sharma	Water quality modelling for different water bodies in the foothills of Himalayas
22	Ms Aastha Gulati	Dr Badal Mukherji	Soil, water, and nutrient conservation, and, livelihood analysis in agricultural micro watershed of Chota Nagpur Plateau
23	Mr Aniruddha Ghosh	Dr P K Joshi	Quantitative biophyscial information retrieval using high resolution multi-spectral sensor (World View-2)
24	Ms Daya Bhardwaj	Dr Nutan Kaushik	Development of chemical fingerprinting and chemometrics methods for quality control of Indian <i>Berberis</i> species and their value-added products
25	Mr Indranil Biswas	Dr Suneel Pandey	Empirical analysis of technology: Mix used in Indian Micro Small and Medium Enterprises (MSMEs) and its effectiveness to sustain in the context of globalization
26	Ms Pooja Arora	Dr Suresh Jain	Biomass burning: A comparative analysis of thermal efficiency in advanced and traditional cookstoves, and estimation and characterization of carbonaceous aerosol emissions based on local practices
27	Ms Pratima Singh	Dr Arun Kansal	Energy use pattern analysis in STPs for scoping for use of renewable energy resources in centralized and decentralized plants
28	Ms Sunita Singh	Dr Arabinda Mishra	Forest ecosystem services and urban water supplies: A PES framework for Mumbai Metropolitan, India

S. no.	Name of the student	Supervisor's name	Topic of research
29	Mr Debashish Saha	Dr Prateek Sharma	Emissions from marine vessels: Indian context
30	Ms Swati Gupta	Dr Arun Kansal	Enhancing the attractiveness of sewage sludge biomethanation through phosphorus recovery as struvite using sludge blanket clarifier
31	Mr Gaurav Pande	Dr Vidya S Batra	Waste derived supported catalyst for VOC oxidation
32	Ms Nidhi Gupta	Dr Vidya S Batra	Utilization of red mud as a catalyst for the processing of hydrocarbons to enhance the production of hydrogen
33	Ms Shipra Rajesh	Dr Prateek Sharma	A study of livelihood vulnerability at local rural scale
34	Ms Richa Sharma	Dr P K Joshi	Phylogeny and behaviour of surface urban heat island in semi- arid conditions of Delhi
35	Ms Mamta Mehra	Dr Chander Kumar Singh	Conceptual framework to understand location specific variability for addressing sustained farm productivity challenges
36	Ms Deepti Sharma	Dr Suresh Jain	Evaluating health effects and risk characterization due to emissions from biomass energy based traditional and advanced cookstoves in rural communities
37	Ms Tarannum Fawzia	Dr Arun Kansal	Residents' perception of river water quality and their willingness to participate in water quality management programme
38	Ms Priya N	Dr Kamna Sachdeva	A study of rainfall variability and cloud formation
39	Ms Priyanka Kohli	Dr J V Sharma	Impact of decentralized forest governance under the scheduled tribes and other traditional forest dwellers (recognition of Forest Rights) Act 2006 on REDD+ in India
40	Ms Shikha Aggarwal	Dr Prateek Sharma	A study of development controls and energy consumption at city level in Indian context
41	Ms Achla Behl	Dr Sapna Narula	A study on the evaluation of the Mobile Medical Units (MMUs) in Uttarakhand
42	Ms Meenakshi Kakkar	Dr Rajiv Seth	Futures trading in agriculture commodities: Risk management strategy for farmers
43	Md Aminul Islam	Dr Shashi Bhushan Tripathi	Germplasm characterization and mapping of pungency locus in Capsicum spp. from north-eastern India
44	Ms P Sabari	Dr Neetika Walia	Isolation and production of bioactive compounds with biopesticidal property from Westiellopsis prolifica and Nostoc spongiaeforme

S. no.	Name of the student	Supervisor's name	Topic of research
45	Ms Mohita Sharma	Dr Priyangshu Sarma	Production of biofuels in bio electrochemical systems
46	Ms Sangeeta Sharma	Dr Shashi Bhushan Tripathi	Marker-based approach to study genetic polymorphisms in Preeclampsia
47	Ms Anjali Bajwa	Dr Vidya S Batra	Carbon membrances and monoliths from bagasse fly ash for environmental and energy applications
48	Mr B R Sharma	Dr Joachim Schmerbeck	Evaluating the efficacy and conservation impact of ex-situ breeding on wildlife conservation in India
49	Ms Madhuri Kumari	Dr Chander Kumar Singh	Geostatistical modelling to predict precipitation in Indian Himalayas of Uttarakhand Region
50	Mr Vaibhav Sharma	Dr P K Joshi	Snow cover monitoring and snowmet runoff modelling in NW Himalaya
51	Mr Raj Kumar Mahtolia	Dr Joachim Schmerbeck	Assessing the impact of convention on biological diversity and national biodiversity action plan on North Bengal forests: A framework
52	Mr Dinesh Chander Pant	Dr Arun Kansal	Development of efficient pretreatment system to improve the viability of AD for organic solid waste
53	Ms Shelly Bogra	Dr Ritu Mathur	India's water footprint by environmentally extended input- output modelling
54	Mr Vipan Kumar	Dr Sapna Narula	Mapping climate technologies for energy sector in India: A comparative study vis-à-vis China and the US
55	Mr Nehru Machineni	Dr M Madhusoodanan	Importance of air-sea coupling in understanding the tropical climate variability using a high resolution regional coupled ocean atmosphere mode (WRF+ROMS)
56	Ms Shikha Tyagi	Dr Anandita Singh	Study of transcriptional regulators involved in flowering in Brassica spp
57	Mr Suneel Kumar	Dr Shashi Bhushan Tripathi	Fine mapping of spot blotch disease resistant QTL in wheat
58	Ms Sneha Singh	Dr Banwari Lal	Screening and selection of efficient microbial strains for bio hydrogen production under thermophilic condition
59	Ms Preeti Aggarwal	Dr Suresh Jain	Health impact assessment of pollutants from surface transport sources: A modelling and epidemiological study

S. no.	Name of the student	Supervisor's name	Topic of research
60	Ms Swarnalakshmi	Dr Rajiv Seth	Barriers to investment in renewable energy: A risk perception approach
61	Ms Ria Sinha	Dr Manipadma Dutta	Emerging sustainability issue in business: The interface between environmental, social, and governance variables and business with special reference to the Indian corporate sector
62	Mr Neeraj Dangi	Dr Sapna Narula	Consumer behaviour in organic food and the role of eco-labels
63	Mr Anadajit Goswami	Dr Arabinda Mishra	Essays on energy transition question
64	Mr Suraj Pandey	Dr Joachim Schmerbeck	Implication of climate change on agro-systems of the Indo- Gangetic plains in India
65	Mr Sandip Mukherjee	Dr P K Joshi	Downscaling of coarse resolution open source remotely sensed satellite-based land surface temperature
66	Ms Anubha Agrawal	Dr Shresth Tayal	An assessment of volume change in summer: Accumulation type glaciers
67	Ms Anita Amarsingh Dahiya	Dr Nandini Kumar	Study of <i>in-situ</i> production of ozone and determination of leighton ratios to differentiate between background, stratosphere-intruded and photo-chemically produced ozone in Delhi
68	Ms Saumya Dhup	Dr Vibha Dhawan	Isolation, characterization and large-scale cultivation of Algae for lipid production
69	Mr Abhishek Saxena	Dr Sitaraman Ramakrishnan	Development of osmotolerant yeast strain for ethanol production from lignocellulosic materials
70	Ms Ruchira Ghosh	Dr Arun Kansal	Estimation of the potentiality of municipal solid waste disposal options for energy and carbon reduction
71	Ms Jyoti Kashyap	Dr Joachim Schmerbeck	Impact of anthropogenic disturbance on prey populations in Kumbhalgarh Wildlife Sanctuary, Rajasthan.
72	Mr Manshu Madan	Dr Prateek Sharma	Stochastic modelling applications for local urban air quality management
73	Ms Poonam Khatri	Dr Arun Kansal	Life cycle approach for improving the sustainability of mustard oil extraction and low-valued cake
74	Mr Manish Gupta	Dr Sitaraman Ramakrishnan	Programmed cell death in Mycobacterium: Study of the role of parDe genetic loci of mycobacterium tuberculosis in macrophage growth and dormancy

S. no.	Name of the student	Supervisor's name	Topic of research
75	Mr Ashish Singla	Dr Priyangshu Sarma	Production of second generation liquid transport fuels using biomass-derived syngas as carbon source by microbial means
76	Ms Tanu Sri	Dr Anandita Singh	Study of functional aspects of regulatory evolution in Brassica SOC1
77	Mr Anshuman Bhardwaj	Dr P K Joshi	Modelling and mapping glacial terrain using geospatial techniques
78	Ms Niyati Naudiyal	Dr Joachim Schmerbeck	Forest dynamics of the Central Himalaya and related changes in the supply of ecosystem services

## LIST OF MOUS

S. no.	Name of the University	Subject
1	Queensland University of Technology, Australia	Joint PhD programme
2	Carleton University, Canada	Academic exchange
3	Freie University, Germany	Academic exchange
4	Chubu University, Japan	Academic exchange
5	North Carolina State University, USA	Academic exchange
6	McGill University, Canada	Academic exchange
7	Technical University of Denmark, Denmark	Academic exchange
8	University of Seychelles, The Seychelles	Academic exchange
9	University of Freiburg, Germany	Academic exchange
10	Tor Vergata Economic Foundation, Italy	Academic exchange
11	The Universite De Reims Champagne, France	Academic exchange
12	Simon Fraser University, Canada	Academic exchange
13	Deakin University, Australia	Academic exchange
14	University of Technology Sydney, Australia	Academic exchange
15	International University of Kyrgyzstan, Kyrgyzstan	Academic exchange
16	Quebec Universities, Canada	Doctoral scholarships
17	Utrecht University	Student exchange

## MEDALS FOR STANDING FIRST

## Convocation 2014

Name	Stream
Ms Vanita Godara	MSc (Environmental Studies)
Ms Dina Nethisa Rasquinha	MSc (Natural Resource Management)
Ms Pallavee Khanna	MSc (Water Resources Management)
Ms Rumia Basu	MSc (Geoinformatics)
Ms Sudeshna Maya Sen	MSc (Climate Science and Policy)
Ms Sneha Sinha	MSc (Plant Biotechnology)
Ms Bhawna Mangla	MSc (Economics)
Ms Megha Anukampa Singh	MBA (Infrastructure)
Ms Nidhi	MBA (Business Sustainability)
Ms Aparna Sankar	MTech (Renewable Energy Engineering and Management)
Ms Denise Fernandes	MA (Sustainable Development Practice)

## **Previous Years**

Year	Name	Stream
2003–2005	Reema Bansal	MSc (Environmental Studies)
	Romit Sen	MSc (Natural Resources)
2004–2006	Poorva Gupta	MSc (Environmental Studies)
	Astha Batra	MSc (Natural Resources)
2005–2007	Prachi Prakash	MSc (Environmental Studies)
	Yamini Panchaksharam	MSc (Natural Resources Management)
2006–2008	Aditi Mehandiratta	MSc (Environmental Studies)
	Chandni Singh	MSc (Natural Resources Management)
	Poonam Kunwar Banerjee	MBA (Infrastructure)
	Madhavi Das	MA (Public Policy and Sustainable Development)
2007–2009	Pallavi Pant	MSc (Environmental Studies)
	Prachi Khanna	MSc (Natural Resources Management)
	Radhika Tomar	MSc (Water Resources Management)
	A P Singh	MBA (Infrastructure)
	Chandni Raina	MA (Public Policy and Sustainable Development)

Year	Name	Stream	
2008–2010	Shreya Dasgupta	MSc (Environmental Studies)	
	Deepa Maggo	MSc (Natural Resources Management)	
	Rudresh Kumar Sugam	MSc (Water Resources Management)	
	Farzana Kolyariwala	MSc (Plant Biotechnology)	
	Neeraj Garg Baruah	MSc (Geoinformatics)	
	Sanjeev Kumar Singh	MBA (Infrastructure)	
	Prashant Kumar Singh	MA (Public Policy and Sustainable Development)	
2009–2011	Marianne Manuel	MSc (Environmental Studies)	
	Pratha Sah	MSc (Natural Resources Management)	
	Divya Gupta	MSc (Water Resources Management)	
	Shailja Bahuguna	MSc (Geoinformatics)	
	Seema Dikshit Venkatesh	MSc (Climate Science and Policy)	
	Pratiksha Jain	MSc (Plant Biotechnology)	
	Parul Gupta	MSc (Economics)	
	Deepak Sharma	MBA (Infrastructure)	
	Mathur Apurva Anil	MBA (Business Sustainability)	
	Reva R	M Tech (Renewable Energy Engineering and Management)	
2010–2012	Mahi Puri	MSc (Environmental Studies)	
	Upasana Jaipuria	MSc (Natural Resources Management)	
	Neha Gupta	MSc (Water Resources Management)	
	Bhartendu Pandey	MSc (Geoinformatics)	
	Divya Sharma	MSc (Climate Science and Policy)	
	Seema Chaudhary	MSc (Plant Biotechnology)	
	Ayush Pant	MSc (Economics)	
	Shilpy Dewan	MBA (Infrastructure)	
	Vandana Rellan	MBA (Business Sustainability)	
	Disha Agarwal	MTech (Renewable Energy Engineering and Management)	
	Praniti Maini	MA (Sustianable Development Practice)	
	Nandita Mishra	MA (Public Policy and Sustianable Development)	

## HONOURS AND AWARDS

### ESRI India User Conference 2013

The 14th ESRI India User Conference 2013 was held in New Delhi in December 2013. The recipients of the award in various categories include the following:



GIS Quiz competition: Deepika Mann, Bakul Budhiraja, and Florencia M Tuladhar; students from the Department of Natural Resources



Best Oral Presentation Award: Abdulhakim Ahmed, MSc (Geoinformatics) student from 2013–14 batch, Department of Natural Resources





Expedition to Antarctica: Archana Dayal, MSc (Climate Science and Policy) student of 2011–12 batch, was selected to join the 33rd Indian Scientific Expedition to Antarctica.



**Accenture Innovation Jockeys, Season 2:** Hunt for India's Most Innovative Minds Award: Rohit Sadaphal, a student of the MTech, Urban Development and Management Programme, for his notable submission which aimed to recognize the most innovative minds across India.



**Earthian 13**: The paper titled 'Possible interventions and challenges related to control of water table depletion in Vasant Kunj and Masoodpur, New Delhi' by the TERI University, was selected as one of the top entries.



Best Poster Presentation Award: Monica Saini, a student of PhD, Natural Resource Management, received the award in the National Symposium on 'Space Technology for Food and Environmental Security', 'Annual Convention of Indian Society of Remote Sensing', and 'Indian Society of Geomatics'. Prof. P K Joshi received the award on her behalf.



**Best Oral Presentation Award**: Anusheema Chakraborty, a student of MSc, Environmental Studies.

# STUDENT CLUBS AT THE TERI UNIVERSITY

### **Book Club**

#### Inculcating a reading habit in students

This club aims to further knowledge and thinking of our students beyond what they learn in their classroom. The idea here will be to have fiction as well as area-specific non-technical reading material that will help each student get an idea about the specialization fields of their friends. The club will hold a literary forum in the University from time to time and will try to infuse enthusiasm towards readings among all students and faculty.

## Sustainable Transport

#### Promoting an environmentfriendly lifestyle

Students should be practicing TERI values and this club aims to foster sustainability through the idea of walking, biking, car-pooling, and using public transport. Collaboration with the Green-Bikes initiative will help make cycling facility available for the students/faculty/ other staff, from the nearest metro station. This can be a good start by the club.

### **Dramatics Club**

#### Street plays/ Theatre dramatics club

Students who have an interest in theatre can spread awareness about the environment and sustainability through street plays. Other theatre groups can also be invited to come and perform on campus. This would increase the liveliness quotient on campus by involving students in the sustainability movement.

## Environment Club (including RWA involvement)

## Students involving the society in the sustainability movement

We start with the Vasant Kunj RWA and then expand our network to include as many as we can for the purpose of creating awareness and encouraging more environment-friendly lifestyles and surroundings among the residents. This includes many activities, such as water management, fuel consumption management, initiatives to boost production, and usage of renewable energy wherever possible. This will look into greening open spaces by having a tie up with Plant a Million Tree or One-Leaf Initiatives of the Delhi government.

#### **Cultural Club**

## Learning about different cultures of India and the world

Since TERI University has a lot of students from all over the world, this club aims to involve all in knowing cultures of others. We envisage students disseminating knowledge about their respective traditions.

## **Biodiversity Club**

#### Doing what we can for the flora and fauna

This include simple things such as taking care of birds, animals, and greenery around the campus. This is can be regarded a specialized and extended branch of RWA involvement club.

## Reach Out Club

#### Reach out to your surroundings

Students are expected to reach out to the community. For example, students could start out with children from the slum next to TERI University. A social responsibility club, this can have a large impact and uplift excluded groups and aim at an equal opportunities for all.

## Leadership Club

#### **TetraPak initiative of TERI Leadership Club**

Students from the University can get more involved with this TERI initiative. Getting in touch with school children would be fun and an active participation in this waste management club would be a real contribution to the city. movie screenings. The club encourages students/ faculty in all artistic pursuits.

## Sports Club

#### **Fitness**

The need for sports and physical activities is undeniable at any age. This club actively promotes enthusiasm for physical activity among all students, faculty members, and staff.

#### Music and Dance Club

#### **Enjoyment**

The SPIC-MACAY concerts, any sort of dance the students want to perform/invite someone to perform and some

## Media and Photography Club

### Social/print/multimedia engagement

Updating social and other media on the activities of all student clubs and the University to create awareness about the University and its philosophy.

### Quiz Club

#### **Quizzing Quiz club**

Inculcate a quest for knowledge among the students.

## TERI UNIVERSITY LIBRARY

The TERI University library exemplifies modern methods for creating, applying, and utilizing digital resources and services. The services are offered electronically through a web-enabled Integrated Digital Information System. All digital resources and services are centrally organized and available via a single-window access.

The TERI University library focuses on enhancing access to digital resources and promoting digital services. It fosters an environment conducive to storing and disseminating information and assisting users navigate through the information overflow, so that credible information can be easily found. The library embarks on University wide information literacy efforts, targeting everyone from students to teachers. It serves as a platform for creative and responsive digital services for diverse user communities. The library proactively engages in scholarly interactions with users through communication strategies that make digital library resources and services more visible, more used, and better attuned to user needs.

The library offers personalized digital services, the digital library literacy classes are integrated into curricula and these are conducted in partnership with faculty in the online learning environment.

On-campus dissemination of special collections, audio, and video, archive, and recorded media provide access to digital collections. The TERI University library also anticipates users' needs, internal and external challenges, and delivers quality digital services. Increasing number of faculty and students travel to study, teach, and conduct research on how the digital library system works across locations to create connections among individuals and departments.

TERI University library customizes digital services for various users based on their needs to support expanding modes of research, teaching, and scholarly communication. The tools have web interfaces that allow integrated access to all intellectual content, in-house e-collection and external digital resources available to the



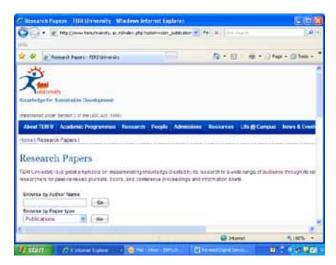
Students using digital services



**Integrated Information System** 



**TERI University Digital Theses** 



**E-Publications** 

University users regardless of format, source, or location. Digital services support TERI University's global and local reach, evolving research areas and specialized teaching and learning needs.

Digital library services' development is prioritized according to user needs. The University's specific in-house special collections are integrated in online networked services.



**Digital News Alert Service** 

To facilitate sharing of resources between libraries, TERI University library familiarizes users within the information available at other university libraries within region, nation, and worldwide. It provides assistance in searching e-resources, helps students become more informationliterate, and conducts subject-specific user-education sessions.

## IT INFRASTRUCTURE AT TERI UNIVERSITY

The TERI University has state-of-the-art IT infrastructure and is equipped with the latest tools and technology. The LAN setup is on a Microsoft platform and is secure from all internal and external threats. The faculty, staff, and students can access IT infrastructure after successful authentication and authorization. The file services are maintained for storing institute data on a central repository. The printing service is enabled for faculty and staff members. Access to multiple resources such as the Internet, University Mail and Collaboration Tool, Students Information System, Learning Management System, University Portal, and Digital Library are made available on all workstations across the University.

The campus is fully Wi-Fi enabled. Two different Internet links to build redundancy are available with a total capacity of 12 mbps. Separate dedicated links are available that connect the campus to access resources such as the University Portal, Digital Library, etc. Cloud technology is introduced for mailing and collaboration which allows faculties, staff, and students to communicate using mail, audio/video/text chat, group discussion, calendar sharing, and data storing. The campus has two dedicated computer labs with 35 computers, having various specialized scientific software installed, such as MATLAB, STATA, SPSS, TRANSYS, etc. The Geoinformatics Lab with ARCServe and ARC GIS software is also available for students. Video conferencing facility for distance learning and a media lab is available for recording and streaming of lectures. A centralized IT



Helpdesk staff is present round the clock for addressing IT-related issues at the earliest possible.

TERI University Portal is an online gateway to information and resources at the University. It helps keep students and the faculty informed of happenings across the campus. The University has created and maintained e-learning portals in Moodle platform for online programmes to offer distance education for student across the globe. These course modules are rich in audio and video and have interactive web-based contents.

## GREEN CAMPUS

## TERI University: Green Campus

A truly green campus, it puts into practice the very principles it teaches in its classrooms. An architectural delight, the campus has been planned to provide a setting that enhances learning, while simultaneously showcasing the concept of modern green buildings.

The green building has 10 classrooms, each having a capacity for 32 students, three lecture halls with a capacity for 60 students, and an auditorium with a capacity for 80 to 100 people. The building also has 10 well-equipped laboratories to compliment cutting-edge research at the University, along with a conference hall.

The campus is aesthetically designed with several features of passive solar design, energy-efficiency, and water and waste management systems.

The planning and orientation of space and building blocks ensures glare-free daylight in all regularly occupied areas. All the liner blocks are oriented in an East-West direction with shorter facades facing the sun. The form of the building itself shades the glazing, such that direct sunlight is blocked at critical times of the day. The exposed facades and walls on the east and west directions have limited glazing.

The shading devices are designed, such that the windows are completely shaded during the summer, which also contributes to reduction in cooling energy demand of the building. Energy efficiency is further enhanced by insulation of the walls and roof and use of high performance window glazing to minimize thermal gain.

#### **Water Management**

To reduce water demand, buildings in the campus have been provided with low-flow fixtures such as dual flush toilets, low-flow and sensor taps that result in 25 per cent savings in water use. Further, the wastewater generated from the hostel building, which is equivalent to 8 KL/ day, is treated through an efficient biological process using a combination of microorganisms and bio-media filter. The treatment system requires low area and energy.

The treated water meets the prescribed standards for landscape irrigation. Rainwater run-off from roof and the site is used for recharge of the aquifer. This enhances sustainable yield in areas where over-development has depleted the aguifer.

#### **Natural Ventilation**

The predominant wind direction was taken into account while designing the open space. Hot air from outside flows into the central court where it passes over the water body and fountain. This makes the air humidified and cooler. As a result, the central atrium area is always cooler than the surrounding exterior.

#### **Cooling System**

The campus is equipped with three types of cooling systems, integrated to take advantage of different innovative technologies to achieve energy efficiency.

- 1. Earth Air Tunnel (EAT)
- 2. Variable Refrigerant Volume (VRV)
- 3. Thermal Storage

Earth Air Tunnel (EAT): The EAT system is used for free cooling/heating of the building for a major part of the year. This technology uses the heat sink property of the earth to maintain comfortable temperatures inside the building. Supplementary systems have been used for extreme conditions (monsoon). In such a system, energy savings of nearly 50 per cent can be achieved as compared to the conventional system. At the campus, this system is used for providing comfort to rooms in the hostel block

Variable Refrigerant Volume (VRV): The VRV system is a modern air-conditioning system, similar to an efficient version of a split air conditioner. The VRV system is highly efficient under partial load conditions and therefore, has been used in areas with varying occupancies such as the office block, laboratories, administrative block, and recreation and dining areas of the hostel block. It features customized control of individual zones. Depending on the cooling demands of the building, VRVs circulate through the chillers. The VRV system also eliminates the requirement of a plant room, piping and ducting for chilled water, and contributes to 15 per cent energy savings as compared to a conventional air conditioning system.

Thermal Mass Storage: Thermal mass storage is used in the classrooms. It involves storing energy when available and using it when required. In the proposed arrangement, cooling of the thermal mass is done during the night (when ambient temperatures are lower). During the daytime when ambient temperatures are high, the thermal storage is used as sink for the fresh air requirement.

Estimated energy savings of up to 40 per cent can be achieved with this system.

#### **Artificial Lighting**

The campus has an efficient artificial lighting system designed to minimize the energy consumption without compromising the visual comfort in the building. This system takes advantage of day lighting, wherever available. Efficient lamps with high lumen output fixed with mirror optics reflectors and bat-wing louvers for glare-free uniform illumination have been installed. All fixtures have energy saving electronic ballasts. With efficient designing, the lighting loads have been reduced from 2W/m2 to  $1 W/m^2$ .

## MEDIA LAB

### TERI UNIVERSITY MEDIA I AB

The media lab at TERI University aims at development of e-content for university education at the postgraduate level in environmental science courses such as environmental pollution and control, water and wastewater treatment, air quality management, integrated impact assessment, and environmental economics. This project addresses the key objective of the National Mission under the Ministry of Human Resource Development by providing accessible, high-quality course material at the postgraduate level in all subjects at affordable costs, with technology-enabled access that will not be limited by geographic constraints.

A media lab with latest audio and video mixer, high-definition robotic camera, and web-streaming server facility is set up at the TERI University for providing distance learning and e-learning. The media lab is equipped with a digital glass notebook for live interaction, two high-definition (HD) plasma screens for clear picture view, Sony Digital Video Recorder (DVR), and 1 Terabyte (TB) of storage server for archiving the course material. The audio/video editing is done using the Sony VegasPro software.

#### **Highlights**

- Development of e-content for online courses or distance learning
- High-definition video output
- Digital notepad for interactive session
- Archiving of recorded videos for future access

## SOLAR LIGHTING LABORATORY

## TERI University Solar Lighting Laboratory

The Solar Lighting Laboratory (SLL) at the TERI University is a unique laboratory that adheres to the International Electrotechnical Commission (IEC) standards for the testing of Solar Lighting Systems (SLS) and happens to be the first laboratory in India which has got the recognition under the Lighting Global Programme of International Finance Corporation (IFC). The IEC is an international body that sets standards for all electrical, electronic, and related technologies throughout the world. The laboratory is also supported by the Ministry of New and Renewable Energy (MNRE) and is currently following all the quality procedures which are compiled by the National Accreditation Board for Laboratories (NABL). The sophisticated equipment and test setup that is used for testing lighting products in the laboratory are calibrated by the National Physical Laboratory (NPL) or NABL accredited calibration laboratories.

Currently, the laboratory's facility is available for testing and long-term performance assessment of various lighting systems (both general lighting and solar-based lighting) and also for carrying out various training programmes for different target groups. So far, SLL has tested more than 120 models of solar lighting systems including solar lanterns, solar home lighting systems, solar task lights, and multi-purpose solar lights. SLL also has collaboration with more than 10 industry partners and research organizations for developing cost-effective solar lighting systems.

The ability of the laboratory to cater to the testing needs of both rural as well as urban lighting infrastructure makes it stand out from other laboratories. The laboratory is working towards strong quality assurance and testing programmes, which will help in building consumer confidence towards the solar lighting products. The IFC's Lighting Asia – India programme is working with TERI to achieve these goals.

Currently the lab works on three thematic areas: (i) testing and on-field performance assessment of various lighting systems; (ii) new system design and customization through research and development; and (iii) training and capacity-building as well as knowledge transfer pertaining to solar lighting system.

As a way forward for the development and expansion of this laboratory, it can further be linked with several other groups or programmes that require General Lighting System (GLS) testing. The supreme testing equipment and authority for high-quality assurance can lead to the transformation of the laboratory into a nodal agency for general (solar) lighting system testing not only for India, but the whole of South East Asia.



## TERI UNIVERSITY LABORATORIES (RESOURCES)

TERI University harnesses the best of modern technologies to support the intellectual curiosity of its students and faculty. Laboratories with advanced equipment and facilities aid and stimulate research.

## **Environmental Monitoring** Laboratory

This laboratory is capable of conducting all kinds of soil, water, and air monitoring experiments required at the Masters level. The laboratory has been created with an objective of providing a facility with all basic equipment required for the analysis of environmental samples soil, waste, water, and air. It caters to the interdisciplinary application based research of the Masters students (science-based) of the University. This laboratory facility is common to two MSc programmes (ESRM and CSP).

#### **Available equipment**

- UV-Visible Spectrophotometer
- Aerosol Spectrophotometer
- Respirable Dust Sampler
- High-volume Sampler
- Gaseous Monitoring Instrument
- Kit Handy Low-volume Air Samplers
- Stack Monitoring Kit PH Meter
- Muffle Furnace Ion Selective Electrode
- Turbidity Meter, Conductivity Meter
- Jar Test Assembly
- COD Digester (reflux)
- BOD Testing Apparatus
- Sensitive Balance
- Bomb Calorimeter

## Biotechnology Laboratory

The Biotechnology Laboratory at TERI University is wellequipped with some state-of-the-art instruments. It also has an advanced computer laboratory with high-end computers enabled with advanced software, such as GCK, PAUP, and MacVector assigned for bioinformatics

applications. Additionally, there is also a separate washing and autoenclaving area, along with an equipment room, dark room, and tissue culture room.

#### **Available equipment**

- Laminar Flow Cabinets
- Gel Documentation System
- Refrigerated Centrifuge
- Benchtop Centrifuge
- BOD Incubator/Shaker
- Deep Freezer (-80 °C)
- Freezer (-20 °C)
- Refrigerator (4 °C)
- Eppendorf Mastercycler
- UV-visible Spectrophotometer
- Protein and Nucleic Acid Electrophoresis Apparatus
- Vortex Mixers
- Weighing Balances
- Magnetic Stirrers
- Software for Sequence Analysis (MacVector and GCK)
- MacIntosh and IBM-PC Computers
- pH Meters
- PCR Machines
- Refrigerated centrifuges, Gel Electrophoresis Systems
- Gel Documentation System
- Deep Freezers
- Plant Growth Chambers
- Hybridization Oven, and Oven Microwave, 42 litre, and Drying oven.

## Geoinformatics Laboratory

The Geoinformatics Laboratory at the TERI University enjoys state-of-the-art equipment, such as high-end computers (dual processor), scanners, digitizers, printers, plotters, hand-held GPS, infra-red thermometer, and others. Digital image processing software, such as Erdas Imagine 9.3/8.7, LPS 9.3, and GIS software such as ArcGIS 9.3 Workstation, GMS 6.0, and WEAP are some of the advanced support systems available. Web publishing tools include ArcGIS advance and ArcIMS servers.

The laboratory is also equipped with open source software and a collection of digital database. A strong network with various research institutions and universities working in the subfields is present. These facilities support R&D activities at various centres of TERI.

machines, DC machines, synchronous machines, and transformers.

### Combustion Laboratory

The Combustion Lab has been established to test the performance of cookstoves based on their thermal efficiency as well as emissions. Internationally accepted protocols, such as Water Boiling Test (WBT) and Kitchen Performance Test (KPT) can be used. The hood method is used to capture and quantify various products of incomplete combustion.

#### **Available equipment**

- Moisture Meter
- **Bomb Calorimeter**
- Equipment to maintain isokinetic conditions
- Aerosol Spectrometer and Dust Monitor
- Low Flow Air Samplers (attached with SKC pump) for collection of bulk aerosols for characterization

## Power Systems Laboratory

The Power Systems Laboratory has been established with an objective to provide the basic knowledge of different equipment used in the power industry to students from

## **Heat Transfer Laboratory**

different engineering backgrounds. The laboratory is

equipped with experimental facilities for training the

students on the following: transmission lines, induction

Heat Transfer is one of the important subjects which is commonly applied in renewable energy systems and energy conservation. Experiments in the Heat Transfer Laboratory are designed to provide exposure to practical aspects of heat transfer. Experiments on various conductive, convective, and radiative mechanisms of heat transfer can be conducted in the laboratory.

## Biofuel and Waste-utilization Laboratory

The biofuel laboratories are distributed between TERI University and TERI Gram at Gual Pahari. Some basic fuel parameters such as proximity analysis and COD can be analysed at TERI University, while experiments on conversion systems such as gasification, biomethanation, and pyrolysis can be carried out at TERI Gram.

### TERI University has been, and is being, supported in its endeavours by



For support to the MA (Public Policy and Sustainable Development) programme



For scholarships in MBA (Infrastructure)



For support to the M Tech (Renewable Energy Engineering and Management) programme



For setting up the Department of Natural Resources



For Initiating the MA (Sustainable Development Practice) programme



For funding a collaboration with Yale University



For scholarships



For setting up a Chair in MBA (Infrastructure)



For scholarships in doctoral programmes



