

TERI SCHOOL OF ADVANCED STUDIES

PLACEMENT BROCHURE

2023

MTech UDM (Urban Development Management)



Chancellor's Message

Established as an institution of higher learning, TERI School of Advanced Studies aims at creating knowledge and human capacity that enables transition towards a more sustainable world.

The foundation of the institute was laid by the Energy and Resources Institute a not-for-profit, independent research organization globally known for its contribution to scientific and policy research in the realm of energy, environment and sustainable development.

As a leader in sustainability education in India and abroad, TERI School of Advanced Studies (TERI SAS) has been transforming students into sustainability professionals who bring sustainable solutions to the problems that hinder growth in rapidly developing countries like ours.

With the help of an interdisciplinary curriculum taught by a multi-disciplinary faculty, the institute imparts world-class education in domains such as climate change, energy, environment, urban development, policy, water resources, biotechnology, geoinformatics and sustainability management among others.

A series of niche programmes offered by the institute that cater to the demands of the industry and are subjected to constant amendments which enable our students to face and resolve issues with ease.

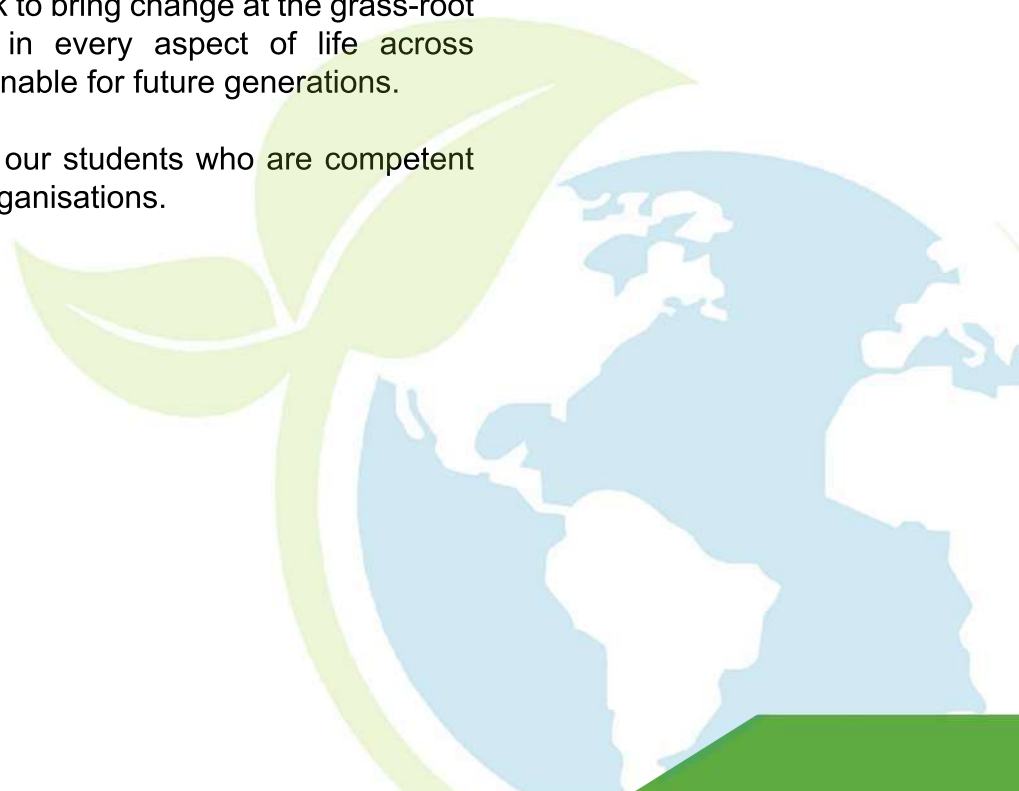
The feedback from the academic peers, employers and other stakeholders always motivate us to work towards improving our teaching methodology and curriculum.

Whether it's the organizations of global relevance such as the United Nations or the organizations that work to bring change at the grass-root level, our alumni are contributing in every aspect of life across continents to make earth more sustainable for future generations.

Therefore, I welcome you all to hire our students who are competent leaders and will be great assets to organisations.



Dr Shailesh Nayak,
Chancellor, TERI SAS



Vice-Chancellor's Message

Dear Development and Industry Partners,

With an aim to create empowered professionals and thought leaders that better aligns the sustainability considerations in pursuit of economic growth and human welfare, TERI School of Advanced Studies (TERI SAS) is a unique institution of higher learning and cutting edge research.

The academic programmes at the TERI SAS have been designed by keeping in mind the challenges of rising population, already depleting and over-exploited natural resources, and opportunities for sustainable development. Over the years, our alumni engaged in diverse domains of various national and international organizations have been the ambassadors of our vision of creating knowledge for sustainable development in both public and private sectors.

The state-of-the-art research by our faculty members helps us to keep our programme curriculum cutting edge, interdisciplinary and solution-oriented. TERI SAS has been a pioneer in sustainability education and it's the unique combination of our multidisciplinary faculty and interdisciplinary curriculum that separates us from the rest of the institutes.

The curriculum ensures that the students inculcate and imbibe the problem-solving attitude through regular engagement with research projects, industry exposure and field visits.

TERI SAS believes in continuously adapting to the change taking place around the world. The feedback from the academic peers at the domestic and international levels, from employers of our alumni and other stakeholders including our students help us to make key amendments in our curriculum and teaching pedagogy.

The multicultural setting comes naturally to TERI SAS as we have students from the diverse regions across India with international students who continuously exchange ideas and experiences, making the institute truly global.

We are certain that you will find our graduates to be competent leaders who adhere to constructive engagements with analytical skills, well versed with contemporary developments in their domains and have solution-oriented approaches. Our graduates will be assets to organizations acclaiming on sustainability.

I welcome you all for the campus recruitment.

Thanking you and best regards,



Prof. Prateek Sharma
Vice-Chancellor(Acting), TERI SAS

About TERI SAS

TERI SAS (earlier TERI University) was established to disseminate knowledge arising from research and development undertaken by The Energy and Resources Institute (TERI), a not-for-profit, independent research institute recognized globally for its contribution to scientific and policy research in the realms of energy, environment, and sustainable development.

In 1999, the University was granted the 'Deemed to be University' status by the University Grants Commission (UGC) and notified vide the Ministry of Human Resources Development, Department of Education, Government of India, notification no. F.9/19/95-U-3, dated October 5, 1999. TERI SAS is also accredited by National Assessment and Accreditation Council (NAAC) with grade "A".

TERI SAS academic programmes are envisioned to provide students with a holistic perspective of the subjects offered and encourage interdisciplinary learning. The University aspires to be an institution of advanced learning which meets the needs of a rapidly growing nation. The University uses modern pedagogical tools, richly supplemented by comprehensive field trips, live industry projects, and hands-on applications.

Administration

The University's Board of Management is responsible for its overall administration and control. All aspects of academic policy are under the purview of the Academic Council, chaired by the Vice Chancellor, which approves curricula, courses and examination results.

ACADEMICS

Since its inception, the wide array of academic programmes offered by TERI SAS have been related to sustainable development and structured around four thematic areas—biotechnology, regulatory and policy aspects, energy and environment, and natural resources.

The University is a first-of-its-kind university in India to dedicate itself to the study of environment, energy, law, water resources, business sustainability and natural sciences for sustainable development.

INFRASTRUCTURE

TERI SAS provides well-equipped laboratories, advanced computer hardware and software, video-conferencing facilities and access to South Asia's most comprehensive library on energy and environment.

Green Campus

Spread over two acres, TERI SAS Green campus comprises of an administrative block, an office block, a convergence and a hostel block. The green campus provides a setting that enhances learning while simultaneously showcasing the concept of modern green buildings including insulation of external walls, terrace insulation, Hunter Douglas louvers, solar water heating system, waste water recycling, rainwater harvesting, solar rooftop system, LED lights and a windmill.

The Academic Council

Chairperson

Prof. Prateek Sharma

Professor & Vice Chancellor (Acting), TERI SAS

Deans

Prof. Ramakrishnan Sitaraman

Professor & Dean(Academic)

Prof. Shaleen Singhal

Professor & Dean(Research & Partnerships)

Prof. Anandita Singh

Professor & Dean(Student's Welfare)

Heads of the Departments

Dr Sudipta Chatterjee

Prof. Vinay Shankar Prasad Sinha

Prof. Naqui Anwer

Dr Sukanya Das

Dr Chaithanya Madhurantakam

Professors

Prof. Arun Kansal

Two Associate Professors from Departments

Dr Chander Kumar Singh

Dr Smriti Das

Two Assistant Professors from the department by rotation of seniority

Dr. Shruti Sharma Rana

Dr Anu Rani Sharma

Nominee by the Vice Chancellor

Prof. Shreekant Gupta

Professor, Delhi School of Economics, University of Delhi

Prof. P.S.N. Rao

Director, School of Planning and Architecture

Prof. Sagnik Dey

Institute Chair Professor, Centre for Atmospheric Sciences, Indian Institute of Technology Delhi

Prof. T C Kandpal

Professor, Centre for Energy Studies, Indian Institute of Technology Delhi

Dr. Vivek Suneja

Faculty of Management Studies, University of Delhi

Prof. Suresh Jain

Professor, IITD

Co-opted Members

Mr. Manoj Chugh

President – Group Public Affairs & Member of the Group Executive Board Mahindra & Mahindra Ltd

Mr. Rahul Mittal

Director, International Tractors Ltd.

Dr Sabhyata Bhatia

Staff Scientist VII, National Institute of Plant Genome Research, New Delhi

Mr. Shubhashis Dey

Director – Climate Policy Program, (Low Carbon Development, Air Quality & Climate Finance), Shakti Foundation

Mr. Niraj Sharma

Chief Scientist, TPE Division, CSIR-Central Road Research Institute

Dr Bidyut Kumar Bhadra

Dy. General Manager, Regional Remote Sensing Centre-North, National Remote Sensing Centre, Indian Space Research Organisation

Dr Madhusudan Sau

Executive Director, R&D Centre, Indian Oil Corporation Limited

Mr. Sudhir Vadehra

Ex-Advisor, Ministry of Power; and Executive Director, REC (Retd)

Controller of Exams

Prof. Shashi Bhushan Tripathi

Secretary

Mr. Kamal Sharma

Registrar (Officiating), TERI SAS

Board of Management

Chairman

Prof. Prateek Sharma
Professor & Vice Chancellor (Acting),
TERI SAS

Deans

Prof. Ramakrishnan Sitaraman
Professor & Dean (Academic), TERI
SAS

Prof. Shaleen Singhal
Professor & Dean (Research &
Partnerships), TERI SAS

Three eminent Academicians nominated by Chancellor

Prof Basabi Bhaumik
Former Professor, IIT Delhi

Dr Sachin Chaturvedi
Director General, Research and
Information System for Developing
Countries (RIS)

Dr Swati Basu
Former Director, National Centre for
Medium Range Weather Forecasting
and Former Scientific Secretary, PSA's
Office, Government of India

Nominee of Sponsoring Society

Dr V.P. Singh
Regional Rep for South Asia,
International Centre for Tropical
Agriculture

Prof. Nitya Nanda
Director, Council for Social
Development

Mr. O P Agarwal
Former IAS and former CEO of WRI

Two teachers (from Prof and Associate Prof)

Prof. Anandita Singh
Professor, TERI SAS

Dr Sukanya Das
Associate Professor, TERI SAS

Secretary

Mr. Kamal Sharma
Registrar (Officiating), TERI SAS

ACADEMICS

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Department of Natural and Applied Sciences

Quality of life depends on the quality and quantity of natural resources available for use in equitable ways. The world today faces an unprecedented challenge of sustainability. Finding a balance between meeting the needs of human population and maintaining integrity of nature around us is the foremost question of our times. It is imperative to understand how natural processes and systems work around us and how to best use them in pursuit of this balance. The Department of Natural and Applied Sciences (DNAS) at TERI SAS is established to impart training for engaging with the questions of natural resource management in a scientifically rigorous manner. It houses faculty members from a diverse academic disciplines with a focus on applied research for informed decision making.

DNAS offers four distinct interdisciplinary masters programs in Biotechnology, Climate Science and Policy, Environmental Science and Resource Management, and Geoinformatics; and two transdisciplinary Ph.D. Programs in Bioresources and Biotechnology, and Natural Resource Management.

Students pursuing their Master's / Doctoral programme at DNAS are exposed to an academically rigorous and interdisciplinary learning environment with a significant emphasis on laboratory work and engagement with contemporary debates, emphasizing exploration and creative thinking and application as essential ingredients of originality in research and learning.

Department of Policy and Management Studies

The primary challenge of the human being is to improve quality of life across generations, an objective now widely recognized as Sustainable Development. This challenge necessitates numerous interventions concerning each of its components: environmental, social and economic. These interventions range from eradication of hunger and poverty to reduction in inequality; from the provision of quality education, good health, decent work environment, water, sanitation, affordable and clean energy to fostering gender equality; from economic growth to effective institutions; from responsible consumption and production to taking urgent actions to combat climate change.

The Department of Policy and Management Studies (DoPMS) at TERI School of Advanced Studies (TERI SAS) aims to contribute to theoretical and empirical enquiry towards informed prescriptions, implementable policies, sustainable practices and management through research, teaching and training. The continued research in sustainability for the business is also one of the key concerns of the Department.

Faculty of the Department have disciplinary backgrounds in Anthropology, Economics, Population Studies, Sociology, Finance & Accounting, Corporate and Commercial Laws, Public Health, Strategy, Business Sustainability, Circular Economy Finance, Climate Finance, Development Studies and Public Policy. Such disciplinary enables the promotion of multi-disciplinary research and learning at the economy-society-ecology interface. The faculties are engaged in active research in their disciplines as well as within the broad theme of sustainable development. This is reflected in their publications, sponsored projects, consultancies and training programmes and supervised research. The faculty regularly engage with the scientific community through seminars and conferences, participate in different forums as experts or resource persons, and engage with the general public through their lectures, print and digital media.

Department of Sustainable Engineering

Over the past half century, the global community has been debating the mode of economic growth, amid challenges of environmental degradation, energy transition and climate change. India among the several emerging economies, though at crossroads, it has chosen a trajectory of sustainable development for ensuring inter-generational equity and inclusiveness in its growth journey. As India is growing economically amid an increased pace of urbanization, the burden on resource utilization and management has increased Substantially. Two prominent sectors such as energy and urban development facing challenges which are bound to increase due to climate change. Addressing these challenges will require trained professionals who can assess the problems, think critically by integrating multiple sectors and create evidence-based solutions. The focus of Department of Sustainable Engineering (DSE) at the TERI SAS is to develop a cadre of professionals having requisite knowledge and skillsets towards addressing the current and envisaged challenges faced by humanity by promoting scientific, technological and policy innovations for strengthening local, regional, and global development agendas.

DSE offers MTech and doctoral programmes in areas of Renewable Energy Engineering & Management (REEM), and Urban Development Management (UDM). The Department is cognizant of the complex environmental, socio-economic, and political challenges that require an integrative approach towards engineering and sustainability. The DSE encourages collaboration with relevant stakeholders including industry, government, academic & research institutions, and multi-lateral organizations to deliver practice-informed research and teaching.

The curriculum of programmes offered by DSE is an eclectic mix of foundational and advanced courses which promotes both critical and creative thinking. The students at DSE are drawn from diverse branches of engineering, science, architecture, and planning which cultivates robust peer learning. The faculty at the DSE has wide experience and expertise across multiple domains, touching upon the two main themes of the Department – renewable energy and urban development.

Coca-Cola Department of Regional Water Studies

The Coca Cola Department of Regional Studies was created in 2014 with a mission to create a cadre of water professionals who can provide systematic solutions to enhance water security. The water science and governance programme aims to prepare regional water champions who can address water problems in a holistic manner that encompasses both the science of water management and the governance and an enabling policy environment with a healthy blend of theory and practice. The teaching programme focuses on cross cutting issues of water resources through science, engineering, legal, socio-economic and institutional dimensions.

The Department offers two Master's level programmes and Ph.D. programme. The M.Sc. programme in Water Science and Governance is an interdisciplinary program with emphasis on development of social, economic, institutional and governance perspectives. The water professionals graduating from TERI SAS are equipped to examine water issues in a trans-boundary and cross-cultural framework transcending environmental science, social, economic and legal discourses. The M. Tech programme in Water Resources Engineering and Management integrates engineering and technological theories with socio-economic principles. The courses address the technical, social, economic, legal and political dimensions of water. Interdisciplinary in its scope and objectives, the programme prepares students for a rewarding and challenging career in water resources management.



COLLABORATIONS

Stressing the importance of the international perspective in its programmes, TERI SAS 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.

Organisation with which MoU is signed

Freie University, Berlin

The Heller School for Social Policy and Management,
Brandeis University

Himalayan University Consortium Charter University of
Iceland

Sambhram Institute of Technology, Bangalore & TERI,
Bangalore

The University of the West Indies, Kingston, Jamaica

Environment Protection Training and Research Institute,
Telangana, India

Karl-Franzens-University, Graz; Ca'Foscari University,
Venice; Leipzig University, Germany; Utrecht University,
Netherlands; Basel University, Switzerland; Hiroshima
University, Japan; Stellenbosch University, South Africa

Gurugram Metropolitan Development Authority, Haryana

Institute for Future Cities, University of Strathclyde,
Glasgow, United Kingdom

Kwame Nkrumah University of Science and Technology,
Kumasi, Ghana

Future Himalaya Institute (FHI), Kathmandu, Nepal

Faculty of Graduate Studies, University of Sri
Jayewardenapura, Sri Lanka

National Institute of Disaster Management (NIDM), India

Purbanchal University, Nepal

The University of Victoria, B.C., Canada
Deakin University, Australia

SM Sehgal Foundation, Gurugram

CPWD, New Delhi

University of Science, Engineering and Technology,
Gambia

Lomonosov Moscow State University

Linnaeus University, Sweden

Mahindra & Mahindra Ltd.

Humboldt University, Berlin

EKI-Energy Services Limited

Canvest Infracapital Inc., Canada

DHAN Academy, Tamil Nadu

Centre for Public Policy Research, Kerala

Emerson Electric Co (I) Pvt. Ltd, Pune, Maharashtra

National Bureau of Plant Genetic Resources

University of Rhode Island, USA



INFRASTRUCTURE

TERI SAS provides the best equipment and instruments, which includes a 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.

Green Campus

Spread over two acres, TERI SAS Green campus comprises of an administrative block, an academic block, a convergence and a hostel block. The green campus provides a landscape that enhances learning while simultaneously showcasing the concept of modern green buildings including insulation of external walls, terrace insulation, Hunter Douglas louvers, solar water heating system, waste water recycling, rainwater harvesting, solar rooftop system, LED lights and Wind turbines.

Laboratories

TERI SAS laboratories are equipped with advanced equipment and facilities to aid and stimulate research.

The different laboratories at TERI SAS are:

Environmental Monitoring Laboratory

The laboratory has been created with the objective of providing a facility with all the basic equipment required for the analysis of environmental samples (soil, waste, water, and air). It caters to the interdisciplinary application of research to all the master's students (science-based) of the Deemed university. This laboratory facility is common for M.Sc./M.Tech. (ESRM, CSP and WSG) programs

Combustion Lab

The combustion lab was established in 2009 with the initial funding received from DST project and MNRE projects. It is a small lab however equipped with instruments used for emission and thermal efficiency testing. Primarily, we conduct experiments based on internationally accepted protocols viz, water boiling test (WBT) and kitchen performance test (KPT) in the above-mentioned lab. The hood methodology is used to capture and quantify the various products of incomplete combustion.

Environment Lab

The laboratory supports master's level experiments pertinent to the laid curriculum. The lab is equipped with instruments required for environmental analysis (soil, water, and air). The laboratory is capable to perform analysis on drinking water, wastewater, surface and groundwater, soil, and sediments, including air quality monitoring, and basic microbial analysis. Laboratory also supports various training programs offered by the university in the associated fields. This laboratory facility is common for M.Sc. (ES, WSG, and CSP) programs.

Centre of Excellence in Thermal Energy Storage

The laboratory is equipped for research on new thermal storage system development for sub-ambient, low, and medium temperature applications and characterizing storage material properties for optimal system design.



Heat transfer laboratory

The laboratory provides hands-on training to students to understand various heat transfer modes, devices and to quantify their characteristics parameters or properties.



Power Systems laboratory

The lab provides fundamental experimental knowledge on different equipments used in electrical power system at various loading conditions and to measure their characteristics.

Hybrid Micro Grid (HMG) laboratory

The lab houses solar PV system, wind turbine, battery energy storage and connected together to develop a hybrid micro grid. The research facility is used for carrying out power flow experiments.

Energy Simulation Laboratory

The lab is equipped with the state of the art software used in Renewable Energy industry. The lab provides in-depth understanding on design, simulation, financial analysis and optimization of various renewable energy technologies for plant/system design and other applications.

Biofuel and Waste Utilization Laboratory

The lab is used to conduct research experiments on the combustion process, fuel properties, biomass conversion, and pyrolysis.

Solar Energy Laboratory

The lab is equipped with outdoor and indoor experimental facilities to conduct experiments on the characterization of solar photovoltaics modules, radiation measurement, and performance analysis of various solar thermal devices/systems.



Geoinformatics Laboratory

The TERI SAS geoinformatics laboratory is well equipped with state-of-the-art equipment such as state-of-the-art computers (workstations), a scanner, printer, plotter, navigation devices, infrared thermometers, etc. It has license for high -end commercial software's like ERDAS Imagine, LPS, ArcGIS, MIKE, GMS, and WEAP along with other advanced support system's mechanism. The laboratory is also equipped with web publishing tools like ArcGIS Advance and ArcIMS Servers. The laboratory is **also fitted with various open-source** geospatial softwares to expose our students to the powerful open-source environment.

The laboratory holds a good repository of geospatial information in both digital and hard formats. The Geoinformatics laboratory of the Department of Natural and Applied Sciences of TERI SAS has a solid network with several research establishments and Universities working in Geoinformatics and other associated fields both within and outside the country. We also support R&D activities of various centres of The Energy Resources Institute (TERI) branches located across the country.



Analytical and Geochemistry Laboratory



The analytical and geochemistry lab caters the needs for research in understanding the earth sciences problems and providing solutions to these problems. The researchers in the laboratory are currently engaged in understanding the natural occurrence of Arsenic, Fluoride and Uranium in groundwater. The lab also has developed prototype nano-materials to remove such geogenic contaminants from groundwater to provide safe drinking water. The lab has established linkages to Lamont Doherty Earth Observatory, Columbia University; Dept. of Engineering,

Massachusetts Institute of Technology, Stanford University. The lab also has developed linkages with institutions in India such as IIT Kharagpur, IIT Guwahati, Jawaharlal Nehru University, SPCB Bihar, Drinking Water Supply and Sanitation, Punjab, Board of Research in Nuclear Sciences etc. The laboratory houses several water field testing kits, flame photometer, double beam spectrophotometer, LED-Fluorimeter, Radiation Survey Meter, Air-dry Oven, Sonicator, pH meter, Muffle furnace, Ion selective Electrodes, Conductivity meter etc.

Biotechnology Laboratory

The Biotechnology Laboratories at TERI SAS are equipped for teaching and research in Biotechnology. The laboratories harbor both basic as well as sophisticated equipment used in modern biotechnology research. In addition to these, the Bioinformatics laboratory is equipped with a high capacity server, workstations and dedicated computers with advanced software such as MATLAB, GCK, PAUP and MacVector. There are two laboratories for M.Sc. teaching and two research laboratories. Furthermore, the students also have access to TERI's research laboratories at Gwal Pahari.



Some of the major equipment installed in the laboratories are listed below:

- | | | |
|--------------------------|-----------------------------|--|
| ●Real time PCR | ●Centrifuges | ●Spectrophotometer |
| ●Zeta Potential Analyzer | ●Incubator Shakers | ●SE 600 Ruby complete, 2D, Vertical Gel unit |
| ●Refrigerators | ●Thermal cyclers | ●2D Gel Electro power supply, EPS 601, GE |
| ●Microscopes | ●EVOX-XL Microscope | ●Gel Doc system XR |
| ●Laminar Flows | ●Nanodrop Spectrophotometer | ●Ice Franking Machine |
| ●Power Pack/Power supply | ●Gene Pulser X Cell | ●Growth Chamber GC - 100 |
| ●BOD Incubator | ●HB-1000 Hybridization Oven | ●Electronic Balances |
| ●Deep freezers -20°C | ●Stereo Zoom Microscope | ●Deep Freezer -80°C |
| | | ●Solar PV Simulator |

Library

One of the key infrastructures of TERI SAS is its well developed and centrally organised library. The library has a number of electronic services and an ever-wider range of resources in order to support teaching, learning and research. The Library also engages in partnership initiatives with academic colleagues and national and international universities. The services are offered electronically through a web-enabled integrated digital information system.



MTech UDM (Urban Development Management)

Programme Overview

India is projected to add 300 million new urban residents by the year 2050 to the already existing large base of 377 million urban residents. The management of such a great magnitude of population in urban areas is a challenge that comprises a constant struggle of coping with the crumbling urban infrastructure, deficiencies in urban services, financial woes at the municipal level, governance issues, and an unprecedented impact on the environment. It is imperative to focus on sustainable urban development by upgrading the existing cities and building new ones - a task that requires not just policy interventions and financial stimulus but also holistically trained manpower to lead through a smart solutions-oriented approach to addressing these challenges in a sustainable manner.

The M.Tech Programme in Urban Development Management (UDM) at the TERI School of Advanced Studies launched in July 2013 seek to develop a cadre of urban practitioners trained in sustainable urban development agenda with a distinctive multi-disciplinary approach. The programme equips students with cutting-edge technical skills like data modelling, managerial capabilities, and an understanding of socio-economic, environmental, and legal issues associated with urban development and associated sectors such as transport, housing, solid waste management, services, and infrastructure. The students gain hands-on experience of tools and software (such as PSPP, ARCMAP, ERDAS engine, and METRONAMICA) required to support evidence-based decision-making.

Apart from classroom teaching, the programme also exposes students to the work of urban local bodies, parastatals, and urban development consultants through two intensive internships. Overall, the programme helps in building capacities for understanding the real-world urban development and management problems and identifying solutions for sustainable urban development.

Programme Highlights

- Research-Based Teaching Pedagogy
- Intensive internships at Urban Local Bodies (ULBs) and Parastatals
- Skill building in Sustainable Urban Development

Programme Structure

The two-year programme offers 75 credits through coursework at the university. The structure includes 12 weeks of mandatory internship with municipal corporations and parastatals, and one full semester of internship with international organizations, consulting firms, financial institutions, research organizations, or urban local bodies.

Course structure

SEMESTER 1

Course Title	Type
Communication Skills and Technical Writing	Core
Introduction to GIS	Core
Stochastic Modelling	Core
Sustainable Provision and Management of Urban Services	Core
Theories of Urbanisation	Core
Urban Development Policies and Programmes	Core
Urban Finance	Core
Urban Governance	Core

SEMESTER 2

Course Title	Type
City and Regional Planning and Management	Core
Geoinformatics for Urban Development	Core
Project Management	Core
Qualitative Research Methodology for Urban Studies	Core
Real Estate Development	Core
Regeneration and City Competitiveness	Core
Urban Ecology and Environment	Core

SEMESTER 3

Course Title	Type
Energy Efficient Buildings	Elective
Major Project Part 1	Core
Sustainable Urban Transport	Elective
Urban Disaster Management and Climate Resilient Cities	Elective
Urban Housing Policy and Practice	Elective
Urban Systems Modelling	Core
Urban Water Supply and Wastewater	Elective

SEMESTER 4

Course Title	Type
Major Project Part 2	Core

Our Faculty



Dr Prateek Sharma
Professor and HOD,
Department of Sustainable
Engineering



Dr Shaleen Singhal
Professor, &Dean
(Research and
Relationships)



Dr Bhawna Bali
Assistant Professor,
Department of Sustainable
Engineering



Dr Abhijit Datey
Assistant Professor,
Department of
Sustainable Engineering



Dr Aviruch Bhatia
Assistant Professor
Department of
Sustainable Engineering



Dr Ranjana Ray Chaudhuri
Assistant Professor
Coca-Cola Department of
Regional Water Studies



Dr. Deepty Jain
Assistant Professor
Department of Sustainable
Engineering

Guest Lectures

Topic	SPEAKER	ORGANISATION
Electrical and fire services	Mr Yogesh Tyagi	DDA
Infrastructure planning particularly focusing on transport planning	Ms. Nandini Shandilya	ICLEI South Asia
Status of urban governance in India	Ms. Meghna Bandelwar	Praja Foundation
Urban planning legislation in India	Mr. Harshil Suresh	Praja Foundation
Mobility and sustainability in urban domain	Dr. D. Dhanuraj	Centre for Public Policy Research
Making cities sustainable: Planning for physical and social infrastructure	Dr. Debolina Kundu	NIUA
Urban environmental planning particularly climate resilience in cities	Ms. Nandini Shandilya	ICLEI South Asia
Heritage based redevelopment and management Urban planning legislation in India	Ms. Madhurima Waghmare	HRIDAY

Why hire us?

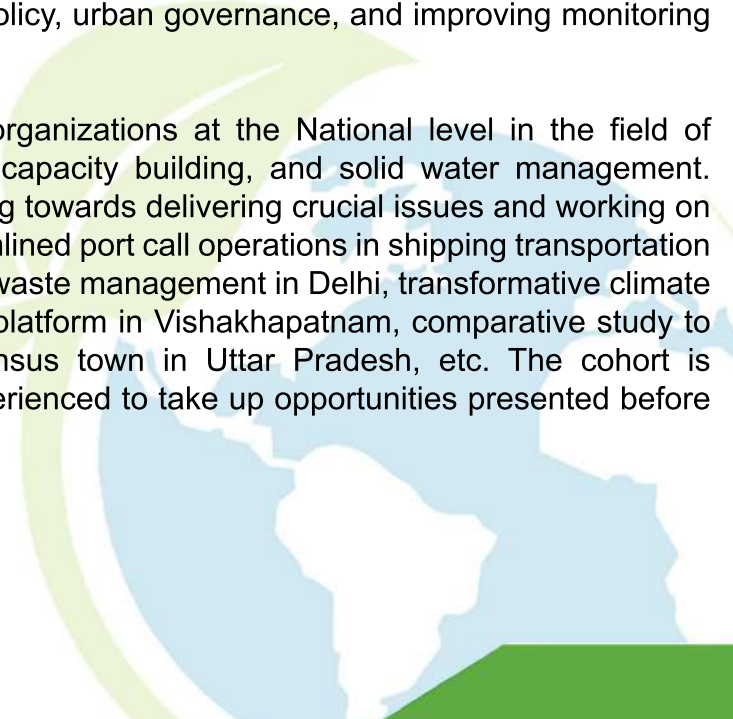
The M.Tech Urban Development Management (2021-2023) is a diverse batch of students from varied professional and cultural backgrounds, hailing from different states of the country. The batch has built a competent and interdisciplinary portfolio of extensive coursework assignments, critical analysis of policies, legislations related to urban governance and analysis of infrastructure like transport, green and blue infrastructure, solid waste management.

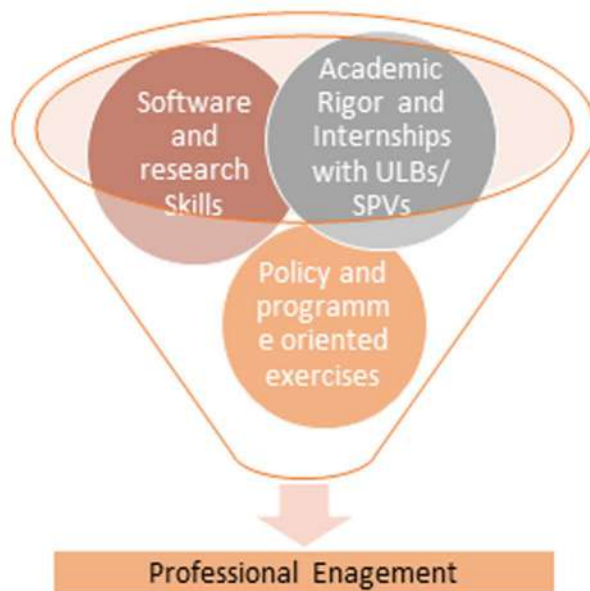
The 2021-23 batch MTech UDM students has shown wholesome participation by actively engaging in workshops as rapporteurs as well as in competitions at both individual level and as team in several prestigious events. They brought honor to the university at individual and college level categories by being the finalists of the “The Prajatantra 2022-2023” competition at the National Youth Conclave organized by Praja Foundation in association with the National Institute of Urban Affairs supported by the Ministry of Youth Affairs and Sports, GoI, which witnessed participation from 216 teams across India presenting their visions for the ‘Model City Governments’.

The learning from the programme has been in tandem with the Sustainable Development Goals and other target action plans in the various sectors that influence the urban space. The knowledge and abilities acquired cover a wide range, from the life cycle analysis of construction and demolition waste produced in greenfield and brownfield development projects to a systemic flow of work for integrated and improved systems for cities—whether in terms of policies, city finances, services, or other elements that contribute to cities uniqueness and competitiveness. The programme has helped the batch in appreciating the importance of city governments taking up responsibility and holding themselves accountable for the same.

The batch has experience of working with local city governments and understanding their functioning as a major project part 1 mandatory internship. The batch has worked with the Delhi Development Authority (DDA), Ghaziabad Development Authority (GDA), Municipal Corporation of Delhi (MCD), and New Delhi Municipal Council (NDMC). Each had chosen niche areas aligned with their interests and worked on projects related to solid waste management, real estate, public policy, urban governance, and improving monitoring and planning with software like GIS.

Currently, the batch is working with a diverse set of organizations at the National level in the field of transportation, climate change, disaster management, capacity building, and solid water management. Through this major project internship, the batch is working towards delivering crucial issues and working on diverse projects like reducing CO2 emissions from streamlined port call operations in shipping transportation at Kandla port, assessment of the current status of solid waste management in Delhi, transformative climate actions using participatory data-driven decision-making platform in Vishakhapatnam, comparative study to evaluate the governance of a statutory town and census town in Uttar Pradesh, etc. The cohort is academically trained and skilled, and professionally experienced to take up opportunities presented before them in a responsible manner.





Snapshot of Student Transition through M.Tech Urban Development Course



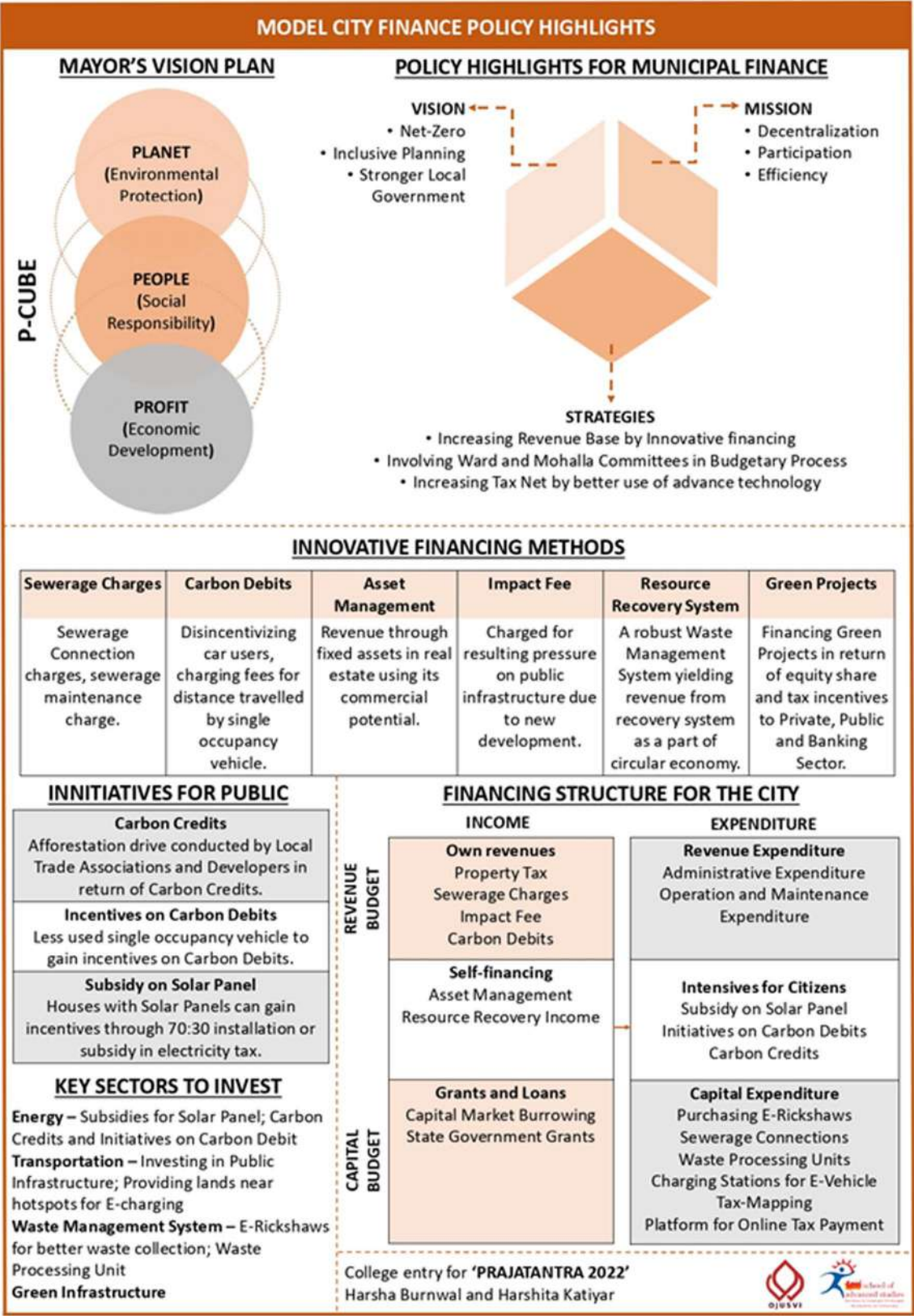
Participation of students in the Prajatantra competition at National Youth Conclave



The meeting with officials at Environmental Planning & Coordination Organisation and Smart city office, Bhopal

Student Work Samples

The highlighted works are selected samples shown, with the explicit purpose to demonstrate the range of skills and understanding developed by the students over the tenure of the course.



LAND POOLING AND TOWN PLANNING SCHEME PROPOSAL

Study Area – Badbai, Bhopal
Land Use – Residential General II

Gujrat Town Planning and Urban Development Act, 1976 used for TP Scheme

Delhi Building Bye Laws used for developing proposal for individual plot of the area.

ORIGINAL PLOTS



PROPOSED PLAN FOR TPS



- Existing Roads
- Khasara Boundaries
- Existing Drains on the site
- Proposed Roads
- Affordable Housing
- Green Area
- Public Purpose
- Land Bank
- Public Utilities

The Development Control Norms have been taken as per Bhopal Development Plan. The Plan have specifications based on Road Width and respective Height, Density, FAR and Ground Coverage. Taking this into account plot specific FARs have been given.

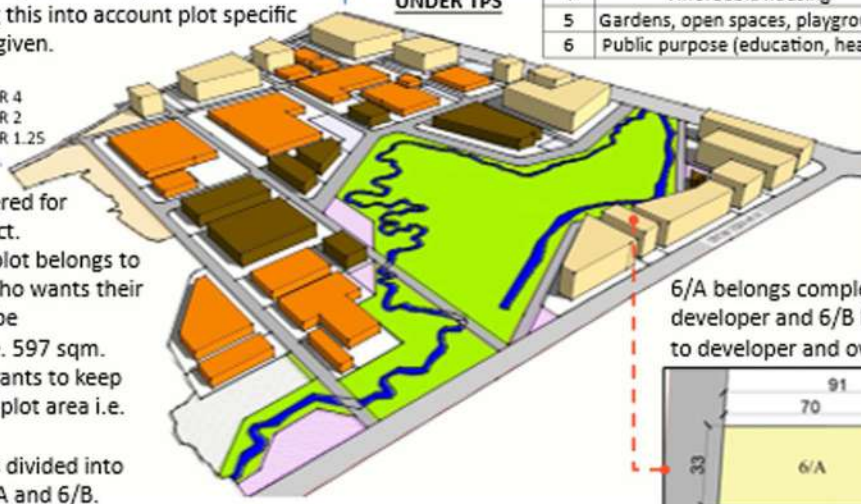
LAND USE AND RESPECTIVE PERCENTAGE OF LAND ALLOTTED UNDER TPS

S.No.	Land Use	Percent
1	Roads	13.0%
2	Land bank or land for sale	2.0%
3	Public utilities	1.0%
4	Affordable housing	3.0%
5	Gardens, open spaces, playgrounds	19.0%
6	Public purpose (education, health)	2.0%

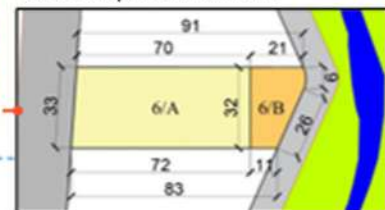
- Buildings with FAR 4
- Buildings with FAR 2
- Buildings with FAR 1.25

Plot 6, is considered for real estate project.

Situation – The plot belongs to 6 land owners who wants their built up area to be compensated i.e. 597 sqm. The developer wants to keep 80% of the total plot area i.e. 2303.42 sqm. For this, Plot 6 is divided into two parts i.e. 6/A and 6/B.



6/A belongs completely to developer and 6/B belongs to both to developer and owners.



Residential Building, Plot 6/A	Rental Accommodation (No. of Floors – 4; No. of Flats – 24)
Commercial Building, Plot 6/A	Convenience Shopping, Offices, Multiplex, Swimming Pool, Gym, Library, Hawkers' Corner (No. of Floors – 7)
Building 1, Plot 6/B	Owners' Flats (No. of Floors – 3; No. of Flats – 6)
Building 2, Plot 6/A	Coaching Center and Sport Facility Center (No. of Floors – 5)

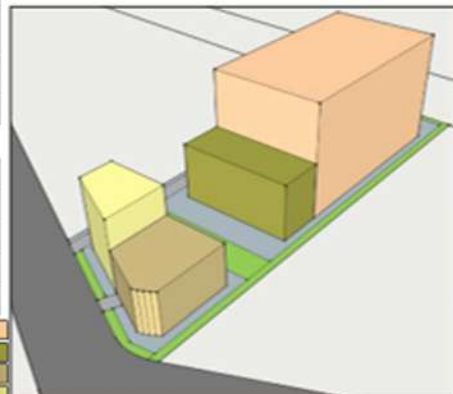
ACHIEVED AREAS

	Required (sqm.)	Achieved (sqm.)
Plot Area to be kept by Developer (80%)	2303.42	2702.19
Remaining Area for Owners	575.86	177.09
Built Up area for Owners	597	579
Total Built Up Area	9098.01	9098.01



Project submitted for Real Estate Development
Harsha Burmwal, Harshita Katiyar
and Megha Chauhan

- Plot 6/A : Residential use building
- Plot 6/A : Commercial use building
- Plot 6/B : Building 1
- Plot 6/B : Building 2



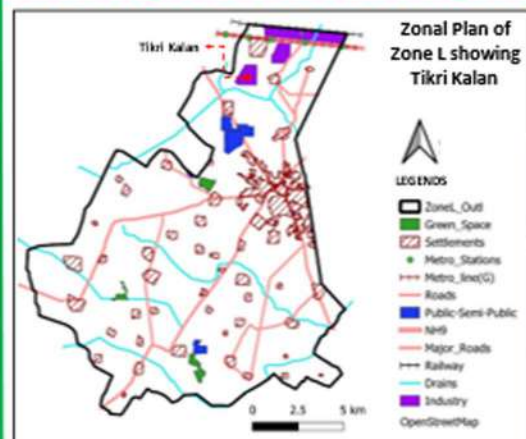
UNDERSTANDING THE PROVISIONS OF PLANNING OF SCRAPE MARKET: A CASE OF TIKRI KALAN

Delhi being a thriving urban center and globally competitive city, is attracting a lot of industries making it a major contributor to city's economy (Economic Survey of Delhi 2001).

Increase in number of industrial units have led to various concerns such as industrial pollution, traffic issues, lack of appropriate infrastructure and negative impact on its economy.

MPD 2021, specifies the need for upgradation and redevelopment of industrial area for their proper functioning. It has also laid down certain provisions for the same.

Understanding these provision thus become necessary to further learn the functioning and impact of such area.



TIKRI KALAN – PVC SCRAPE MARKET

Located in Planning Zone L, West Delhi, PVC Scrape Market is an industrial area for recycling of plastic waste. The area have a capacity of recycling plastic waste of 50 tonnes per day.

AIMS

OBJECTIVE
To understand the provisions of planning different aspects of transportation, physical and social infrastructure, environment and economy.

- To understand the provisions of transportation in light and service industrial areas.
- To study and assess the status of social and physical infrastructure services and their impact on the workers of the PVC market.
- To analyse the impact of management and handling of plastic in the Plastic Scrape Market on the environment.
- To explore the operational structure of the scrape market in terms of the economy.

TRANSPORTATION

The transportation is studied on two baseline that is, URDPFI Guidelines 2014, MPD 2021 and MPD 2041.



Location advantages

Tikri Kalan is located at Delhi Haryana border at Bahadurgarh Punjabi Bagh NH10 and thus facilitates a corridor for the interstate freight movement. Boundary of Tikri Kalan touches boundaries of 8 villages in Delhi and Haryana which supply the daily wage labourers.

Current status

1. Increased pressure on roads due to informal activities.
2. Road material not able to bear the frequency of vehicles.
3. Connector Roads 18-24m are in bad shape and not adequate to cater the daily traffic.
4. Spillage of PVC waste material on roads cause obstruction in vehicular movement.
5. Inadequate parking space for vehicles.



PHYSICAL AND SOCIAL INFRASTRUCTURE

The physical and social infrastructure is studied on two baseline that is, MPD 2021 and MPD 2041.

Physical Infrastructure

The services of Water, Sewerage, and Drainage are analyzed.



- No planned water supply. Water tankers used for meeting the water demand.
- Quality of underground water is not good.
- Sewer Lines have been laid in the market area but maintenance of the sewer lines is not done.

Social Infrastructure

The Safety and Security Infrastructure, Healthcare, Public convenience, and other community facilities are analyzed.



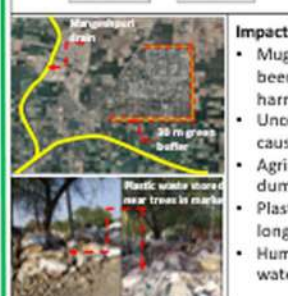
- Only two fire fighting vehicles are designated for fire incidents which are not sufficient.
- Dispensary is being used as store.
- Toilets present on the site are not maintained and are currently closed.
- No community facilities such as crèches or care centers are present in the PVC Market for the need of children

ENVIRONMENT

The environment is studied on baseline of Sustainable Development Goals and MPD 2041.



The key operations activities include trading, sorting, disassembling, and grinding. Plastic waste flow from the PVC market to recycling factories.



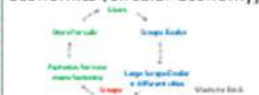
Impacts

- Mugheshpur drain near the PVC market, has been contaminated due to leaching of harmful chemicals in groundwater.
- Uncontrolled disposal of plastic waste causing land and soil pollution.
- Agricultural fields degradation due to dumping of plastic into fields.
- Plastic waste is stored near trees causing long term negative impact on ecosystem.
- Human health affected due to air pollution, water contamination and land degradation.

ECONOMY

The economy is studied on two baseline that is, MPD 2021 and SDG 8.

Incentives for setting up clean economics (Circular Economy)



Set up by MoUD for reducing the plastic waste and usage of new resources. Forward and backward linkages shows that the market carries out circular economy and only a limited amount of waste is generated.

Facilitative norms for ancillary facilities

Decent work with equal pay



Promote safe working environment

On ground survey shows no such infrastructure is present in the area.

Open ended interviews suggested that female worker are paid lesser than male workers. Workers employed on daily basis are also paid lesser than employee workers.

It was found out that workers here are expose to methane. Absence of proper gears and equipment was also observed.

Project submitted for City and Regional Planning and Management
Harsha Burmal, Harshita Katiyar, Megha Chauhan and Tejashmi Kasar

The study can be taken forward by providing the suggestions for the problems identified in each of the sectors, further leading to improving the condition of the industrial area Tikri Kalan.

CONSTRUCTION AND DEMOLITION (C&D) WASTE MANAGEMENT AND FEASIBILITY STUDY OF WASTE MINIMIZATION THROUGH CIRCULAR ECONOMY

AIM OF THE STUDY - To quantify the C&D Waste in Redevelopment project.

OBJECTIVES-

- To understand the C&D waste management practices in the redevelopment area.
- To provide an overview of the link between C&D waste management and Circular Economy.
- To understand C&D waste ecosystem, resource challenges and resource efficiency and its potential for reuse as secondary waste material in construction sector.
- To identify gaps in C&D waste management practices.
- To identify the opportunities for recycling and reuse of C&D waste.
- To investigate the legislative and other barriers for efficient recycling and reuse of C&D waste.

REDEVELOPMENT SITE DETAILS

Location: Karol Bagh, Delhi, India

Area : 196 sqmt (Basement & GF), 155 sqmt (FF-FF) (1012 sqm cumulative)

Floors: 1 Basement, Ground +4 Storey

Total Height after redevelopment= $3.2 \times 5 = 16\text{m} + 3.4\text{m}$ Basement

Use: Mixed Use (Residential and Commercial at Ground Floor level).

Old Use: 2 Storey Commercial

Demolished waste Generated: 48 Vehicle of 3.8 tonn capacity (183 Tonn approx) (183 cum)

Specification of material used

Structure- RCC, Wall- red brick masonry, flooring, PCC, Tiles, granite

Windows- Aluminium windows

Door- wooden doors.

Waste Management Legislation and Policy- C&D Waste Management Rules, 2016 (GOI)

Sr No.	C & D Waste (BIS IS-383)	Plain Concrete	Reinforced Concrete	Lean Concrete	Extent of Utility
1	Recycled concrete aggregate (RCA)	25%	20% (upto M25 grade)	100%	Coerced Aggregate
2	RA	Nil	Nil	100%	
3	RCA	25%	Nil	100%	Fine Aggregate

FINDING OF THE STUDY

Sno.	Scenarios	Description	Total Embodied Energy (EE)	EE saving WRT new material
1	Scenarios 1	Material used as per actual site condition	28,36,857.25	21,838.2
2	Scenarios 2	Use of reused tiles as mosaic tiles, brick bats for filling etc.	26,03,637.25	2,55,058.2
3	Scenarios 3	Use of all new construction material	28,58,695.45	0

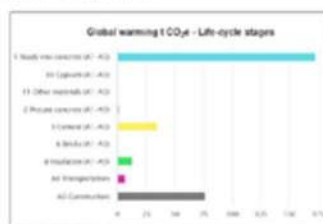
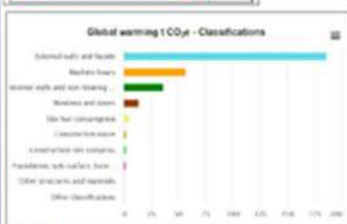
IDENTIFIED GAPS

- Despite the mandates the all sites are not optimally using the C&D waste due to client preferences, negligent strictness and check for the mandate.
- The C&D waste material is still being illegally dumped by the demolition contractors due to ignorance and choice of taking risk of practicing the illegal activity as no specific space is allocated by the authorities to collect the C&D waste at nominal prices.
- It is recommended to take fees for C&D waste processing during granting the construction permission to the building and provide facility for dumping the waste at government facility during construction phase.
- There should be strict mandates to encourage the contractors to purchase the recycled materials.

RESULTS OF LCA

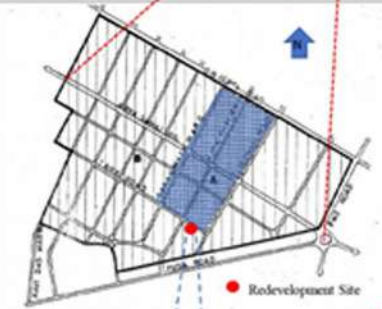
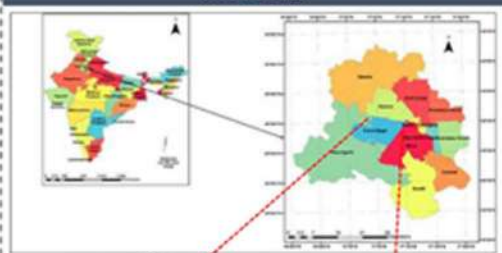


- LCA analysis, the cradle to gate (A1-A3) impacts shows CO2 global warming potential is 301 kg equivalent per meter square for construction of the project.



Project submitted for Urban Ecology
by Megha Chauhan and Tejashri Kasar

SITE DETAILS



MFA- Material Flow Analysis



Site Photograph





CONCLUSION OF THE STUDY

- Demolished waste Generated: 48 Vehicle of 3.8 tonn capacity (183 Tonn approx) (183 cum) Thus percentage of recycled waste used in reconstruction = 5.57%
- Remaining 95% of waste is dumped in available vacant plots (nangloi, wazirabad)
- The clients are resistant to use the recycled waste as they are inclined to use the new material and are in doubt for the strenght of the recycled materials.
- Architect dont recommend the use of recycled material in line with the client requirements. As the recycled material are difficult to pass the quality check and specification requirements in most cases.
- Unquantified problems - spillover impact on ecosystem, aesthetic impact, non permeable area.

Students' Profile

The cohort 2021-2023 is a dynamic batch with varied interest and experiences. The students are currently working with the Urban local bodies (ULB) and Special purpose vehicles (SPV) across the country to hone their understanding of the management, functioning and governance systems, practiced within these institutions. The details of the students with the project they are working on is given below,

 <p>Harsha Burnwal</p>	Academic Background	Bachelor in Planning (B.Plan) , 2020 School of Planning and Architecture, New Delhi
	Major Project 1 Organisation	Delhi Development Authority (DDA)
	Internship Project	Feasibility of Regeneration Policy of Planned Areas in Delhi
	Interest Areas	Public Policy, Public Finance, Real Estate, Sustainable Development, Data Analytics, Housing, Transportation, Disaster and Climate Change, Project Management
	Major Project 2 Organisation	The Energy and Research Institute (TERI), New Delhi

 <p>Harshita Katiyar</p>	Academic Background	Bachelor of Architecture (B.Arch.), 2018 Faculty of Architecture and Planning, APJAKTU, Lucknow, Uttar Pradesh
	Major Project 1 Organisation	Ghaziabad Development Authority (GDA)
	Internship Project	Change analysis of actual growth and development with proposed master plan: A case study of Ghaziabad
	Interest Areas	Sustainable development, Urban Governance, Project management, Climate change, Solid Waste Management, Research and Development
	Work Experience	16 months DC Studio, Indrapuram, Ghaziabad
	Major Project 2 Organisation	Praja Foundation, New Delhi



Megha Chauhan

Academic Background	Bachelor of Architecture (B.Arch.), 2012 Giani Zail Singh College of Engineering and Technology, Bathinda, Punjab
Major Project 1 Organisation	Municipal Corporation of Delhi (MCD)
Internship Project	Sustainable Framework to Achieve Efficiency in Primary Collection, Segregation and Decentralized Processing of Solid Waste: A Case Study of Central Zone, Municipal Corporation of Delhi.
Interest Areas	Urban Governance, Transportation, Solid Waste Management, C&D Waste Management, Sustainable Urban Development Policies, GIS
Work Experience	9 Years L&T Construction as Senior Architect
Major Project 2 Organisation	The Energy and Research Institute (TERI), New Delhi



Tejashrri Kasar

Academic Background	Master of Science (Environmental Science). Fergusson College, Pune
Major Project 1 Organisation	New Delhi Municipal Council (NDMC), New Delhi
Internship Project	Assessing the Role of Public Participation in Waste Management in New Delhi Municipal Council (NDMC)
Interest Areas	Public Policy, Urban Governance, Municipal Finance, Solid Waste Management, Disaster Resilience and Management, Climate Smart Cities, Sustainable Development
Work Experience	3 Months Centre for Science and Environment (CSE), New Delhi
Major Project 2 Organisation	NITI Aayog, Government of India, New Delhi

Placement Procedure and Guidelines for Recruiters

The University has a system of getting its students informed and updated through an active placement cell. The curriculum is designed to introduce the students to a host organisation as an intern for a minimum period of 15 weeks, making them professionally fit for absorption into the workforce. Thus, the campus recruitment activity for M Tech (Urban Development and Management) is conducted to serve dual purpose—placement of the students for their final project which is undertaken in the fourth semester and the formal job recruitment on completion of the programme.

Some of the key recruiters have been:

- IPE Global
- KPMG
- Mehta & Associates
- Consortium for DEWATS Dissemination (CDD) Society
- Five-M Energy Private Limited
- Urban Management Centre (UMC)
- ICT Consultants
- ICLEI South Asia
- Simplex Infrastructure Limited
- Housing and Urban Development Corporation Limited (HUDCO)
- National Institute of Urban Affairs (NIUA)
- Centre for Economic and Social Studies
- Centre for Environment Education
- Nagrika Policy Research Foundation and
- Praja Foundation
- TERI

Our placement process consists of two phases:

Masters' Thesis Project	
Recruitment Period	Availability of Students
November to December 2023	January to June 2023

Job Placement	
Recruitment Period	Availability of Students
November 2022 to June 2023	June 2023 onwards

We welcome you to visit our campus for interviewing and selecting students for major projects and final placements. You may interact with the students either through telephone, video conference, or in person.

Interested organizations may contact the Placement Cell. The contact details are mentioned at the back of the brochure.

PLACEMENT CELL

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Harsha Burnwal

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Faculty Placement Coordinator:

Dr Bhawna Bali

Assistant Professor,
Department of Sustainable Engineering
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For further information, Contact

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