IITM Green Agenda Initiatives

Bhaskar Ramamurthi and R. David Koilpillai

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Executive Summary

This report has been prepared in response to the letter from Ms. Amita Sharma, Additional Secretary, MHRd dated Dec 19, 2013 – regarding steps taken by IIT Madras as part of the IIT Council Green Agenda.

This report summarizes the various initiatives at IITM pertaining to green technologies and sustainability. A brief description of the nature and scope of activities is provided. Environment-related activities have been ongoing at IITM for several years as a result of the nature of the campus and the commitment of the campus community to protect and preserve the rich biodiversity. Additionally, in light of the inputs received from Standing Committee of IIT Council (SCIC) and MHRD, IITM has a "Green Office" and has planned to undertake additional measures to enhance the awareness and stewardship of environment-friendly technologies. This will be made an integral part of the academic curriculum to complement the content already included as a compulsory part of the instruction provided to all undergraduate students. In many aspects, IIT Madras has already launched an active "Green Drive" and is ready to participate in any additional initiatives that may proposed in the future.

Specific responses

(a) Setting up Green Office
- **Done.** Coordinated by Chairman, IITM Campus Environment Management Committee (CEMC)

(b) Green Master Plan
- **Done.** Ecology-sensitive considerations incorporated in the IITM Master plan completed in 2012
- GRIHA compliance mandatory for all new construction

(c) Bio Diversity
- **Implemented.**
- Closely monitored and maintained by Campus Environment Management Committee
  - Black Buck and Chital Deer census being done annually (last census August 2013)

(d) Awareness:
- **Ongoing**
- Prakriti, the Nature Club of IITM, organizes regular campus walks for students (all age groups) for bird-watching and to appreciate the flora and fauna.

(d) Creation of Water Bodies
- **Implemented**
- Rain water harvesting implemented on campus
- Recycling of gray water being done in hostel sector

(e) Carbon Footprint and Green Audit
- **To be implemented**

(f) E-reporting
- **To be implemented**

Key Inputs:
IITM has activities in all areas of "Green Agenda" highlighted by the IIT Council, Ms. Amita Sharma's letter and the Kakodkar Committee Report.

Initiatives within IITM Campus
IITM Green Office
- The **Campus Environment Management Committee (CEMC)** of IIT Madras has been functioning for more than 5 years. This committee is constituted by the Director and is chaired by the Dean (Planning). It has representatives of the Engineering Unit, the faculty members, staff, students, other campus residents as its members, along with the Chairs of the Engineering Unit and a biodiversity expert (external). This committee has coordinated issues related with building footprint and the efficiency of land usage, fauna and flora on campus and the impact of the Institute's activities on them, waste disposal, etc. **This committee will fulfil the role envisioned for the Green Office**
- **The IITM Green Office will be a function under the CEMC and coordinated by the Dean (Planning).** This has been decided by the Director and will be implemented accordingly.
- The scope and responsibilities of the CEMC has been expanded to include issues such as green audits, monitoring of institutional management practices – energy, water waste, construction projects.
- The maintenance and publishing of the Institute's green parameters, and interaction with the community.
- The CEMC will be working in partnership with the **Prakriti, the wildlife club of IITM** to address biodiversity conservation issues. The services of experts will be utilized to address the biodiversity aspects.

Solar Energy Initiatives
- A project for the installation of a 100 kW solar power plant (pilot plant) followed by 1 MW solar power plant are in the process of being implemented. This will be the first phase of renewable energy usage on campus. The Solar PV system will be a roof-top system which will be grid-connected.

Green Master Plan
- A master plan for the next 20+ years has been drawn up by a duly-appointed architect with input from the campus community, administration, green technology consultants and biodiversity experts. This was completed in 2012 placing special emphasis on "green initiatives". The IITM master plan 2012 has been published and is being followed for the growth of the campus.
- Green construction practices have been adopted in the Institute for several years, including the use of concrete bricks, fly ash in all structural concrete, higher concrete grades to obtain longer service life, seismic resistant design to ensure safety and delay obsoleteness
- The IITM campus has been following for many years a policy of minimal landscaping and paving. The total constructed is kept under 28% in order to sustain the plant and animal biodiversity of the campus.
- All recent constructions on IITM campus comply with the **GRIHA 4** rating.

IITM OWZONE

- IITM campus has a self-help group called OWZONE (Zero waste) which handles recycling of all solid waste segregation generated on campus. With the intention of making the campus a zero waste zone, OWZONE collects, sorts and recycles all waste in a responsible manner, sensitive to institute environment and surroundings.
- The campus also uses waste water treatment and recycling of gray water for gardening and toilets.

Bio-Diversity

- A biodiversity report was published in 2006 based on an extensive study by external experts, which has given guidelines for the protection of wildlife and native flora on campus. Wildlife censuses have been carried out since then (in 2012 and 2013) to assess the effects of campus development on the fauna.

Creation of Water Bodies

- In order to recharge the water table, all rainwater is channelled through storm water drains to the campus lake, and flow out of campus is minimized.

Other Green / Environment Friendly Initiatives

- IITM has a ban on the use of plastic bags
- The use of bottled water containers (individual use size) is minimized. Water dispensers are installed throughout the campus.
- IITM has started a minor program for B. Tech. students in the area of sustainable infrastructure and environment management.
- We have a core course on Ecology and Environment, which has to be taken by all the undergraduate students.
- IITM campus has a ban on powered vehicles for students

IITM and Society

- **NSS Project Bessie (2012-13)**
The Besant Nagar beach in Chennai is a favourite spot in Chennai. However, this also means a large amount of garbage is generated on the beach front and without the proper means of disposal. This project tried to address the problems with our volunteers going on weekly visits to the beach to clean up a specific area and more importantly to interact with the sections of the crowd in an effort to sensitize them about the issues of excessive solid waste pollution.

- **NSS Discovering The Future (2012-13; 2013-14)**
The project involves going to high schools in Chennai and creating awareness about the need for sustainability and sustainable practices through interactive lecture-demonstrations.

- **NSS Project Paws (2013-14)**
Through this project we collaborate with the Blue Cross Society in providing service to the abandoned and rescued animals. We also plan to increase the awareness on pet adoptions.

- **The Canal Project (2013-14)**

The Buckingham Canal passes through Chennai, very close to our campus. Originally supposed to be used as a waterway, it barely has any water left in the Chennai section now. In many sectors, it has become a sewage outlet. Along its banks are heavily populated areas and some slums. Through this project, initially we aim to study the current condition of the canal and its relationship with the settlements, factories, and other factors placing the people at the centre of the study. We are trying to recommend solutions in conjunction with them through regular discussions - especially understanding their concerns and attitudes.

Water-Related Initiatives

- IITM has been involved in training the village volunteers, Panchayat Presidents and Secretaries in five blocks of the Krishnagiri District of Tamilnadu, involving more than 150 panchayats on water quality, health, hygiene and sanitation. They trained them for water quality surveillance, which had improved the water quality significantly.
- IITM has developed an easy to use water quality test kit, which is extensively used by UNICEF and a few NGOs in Tamil Nadu for water quality surveillance.
- IITM has developed effective and economical point of use filters for water treatment. This is deployed in an urban slum in Chennai.
- IITM developed green technologies for remediation of soils and aquifers contaminated with heavy metals such as chromium. These technologies are field tested and have already been used by private companies for chromium contaminated aquifer and soil remediation.
- IITM has developed green technologies for treating flue gases containing NOx and SOx. These are adopted by commercial organizations.
- IITM has developed green technologies based on bioremediation, advanced oxidation, and adsorption for the treatment of water and wastewater contaminated with pesticides, complex organic compounds and pharmaceutically active compounds
- IITM has a Center of Excellence in Decentralized Wastewater Management, sponsored by Ministry of Urban Development
- A new center for Technology Development and Demonstration has been started with the aid of Tamil Nadu Pollution Control Board
- IITM has been helping different organs of Govt. of India and other state governments in the field of environmental problems caused by industrial activities
- IITM has been actively involved in socially relevant projects, like humane sewer cleaning systems, radial coastal wells etc.
- We conduct many short term courses / training programs for students and faculty of other colleges / industries in the area of water, waste management, sustainability, pollution control and disaster and risk management.
- IITM technologies for clean water using nanotechnology are used to make pesticide-free water.
  - ➢ Provide arsenic free drinking water in West Bengal. Community filters are being installed in several places.

Transportation-Related Initiatives

- Transportation is a major component of Green Initiatives and Sustainability. **The Centre of Excellence (CoE) in Urban Transport** at IIT Madras, sponsored by Ministry of Urban Development, Govt. of India, undertakes cutting-edge research and development activities in the areas of Intelligent Transportation Systems (ITS), Urban Transportation Systems Planning, Congestion Management, Road Safety and Road Pavement Management System. The Centre also interacts with user agencies (such as Chennai Traffic Police, Chennai Metropolitan Development Authority, Tamil Nadu Road Development Company Ltd., Tamil Nadu Road Sector Project) and the sponsor in addressing urban transport problems. The Centre also offers internships to students from other colleges.

IITM Socially Relevant Projects

With strong support from the institute and the IITM alumni, a wide range of socially relevant projects are being carried out. Every one of them is an engagement with society outside IITM, mostly in rural contexts and to see how green technologies and sustainability can play a role. Two examples are given below:

1. Working with **GNAPE** Group for Nature Preservation and Education, an NGO to address the issue of air pollution from the smoke in the potters' kilns in Nagercoil. IITM is working on reducing the air pollution from the kilns
2. Working with **ODAM** - Organisation Of Development Action & Maintenance, an NGO in Virudhunagar, Tamil Nadu to address the issue of clean technology for the production of coal from prosopis. The area being addressed is located between Dindigul and Madurai.

IITM Activities in Air Pollution Monitoring

- A continuous ambient air quality monitoring station setup at IIT Madras in collaboration of Central Pollution Control Board (CPCB), Ministry of Environment and Forests, provides real time air quality information to public through large digital display system (on line).

For additional details:
Prof. R. David Koilpillai
Dean Planning, IIT Madras
davidk@iitm.ac.in
9444009080