



ECO-FRIENDLY CAMPUS POLICY

Version 2.0



ASSAM
DON BOSCO
UNIVERSITY

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1. INTRODUCTION

An Eco-Friendly University agenda for Assam Don Bosco University is its road map for building and operating a healthy and self-renewing vibrant Campus community. The Eco-Friendly University concept envisages a system with clear cut goals and priorities in the areas of education, clean energy, nature and ecosystems. Located in Guwahati, the gateway to North East India, a region rich in endemic flora and fauna, the University has created a Campus with a commitment to- environmental sustainability with clarity in its adoption and consumption of clean energy, management of water sources, conservation of flora and fauna, organic waste management and productive use of land. The Campus has a natural forest cover and is the refuge of varied endemic species of wildlife. The hilly terrain of the area makes accessibility a challenge and therefore the architectural planning of the Campus required the spaces and structures to be set up in a way, which blended in with the natural landscape while also being accessible and eco-friendly. The Tapesia Campus (main Campus) is nestled in the serene Tapesia Gardens, off National Highway 37, is spread over 274 acres of undulating hills. Placed in the outskirts of the city and nearby a Wildlife Sanctuary, this Campus is blessed with natural resources and diverse life forms. With an idea to create an environment where youth can be educated to live a sustainable life in harmony with nature, the University has formulated the eco-friendly policy with the following context and objectives:

2. CONTEXT

- **Accessibility:** The hilly terrain came in the way of creating spaces for academic, residential and recreational areas that blended in with the landscape while being also accessible and eco-friendly.
- **Storm Water Management:** On a few occasions, due to the lack of planned drainage management of the entire Campus, unexpected heavy rainfall caused serious soil erosion on some slopes of the hilly terrain.
- **Management of wildlife in the campus:** The Campus is home to a number of endemic species, several varieties of snakes, birds, hordes of wild bees and also provides forest cover for an animal corridor.
- **Security issues:** A Campus covering 274 acres with a lot of dense forest cover calls for an effective yet unobtrusive security plan.

3. OBJECTIVES

The objectives of the University's Eco-Friendly Policy are:

- Creating a collaborative effort among the University fraternity in fostering an eco-friendly learning and working environment.
- Ensuring the sustenance of biodiversity by maintenance of the natural environment in addition to conservation, restoration, and remediation of existing land and water.
- Managing waste generated in the Campus through proper disposal and treatment.
- Commitment to sustainable management of land through agroforestry and kitchen gardening for meeting the food requirements in the Campus.
- Raising awareness of real-world issues affecting the rural communities living adjacent to the University Campus and working towards addressing these issues in partnership

with the communities through teaching, research and extension activities.

- Encouraging students to participate in outreach education programmes as a part of Service Learning.
- Protecting, monitoring, and conserving flora and fauna of the Campus and preservation of their natural habitat.
- Identifying existing invasive species to reduce their negative impact on the indigenous flora and fauna.
- Involving local communities in the custodianship of natural resources and utilizing local resources for infrastructure construction purposes.

4. RESPONSIBILITIES

The main responsibility for implementation of this policy lies with the Board of Management. The Directors of Schools and the Heads of Departments are responsible for ensuring compliance with University Environment Policy within their area of control.

The Administrative Officers of the University will actively monitor the performance of Schools and Departments in the implementation of the aims and objectives of this Policy in the activities under their control.

Whilst the University accepts the main responsibility for implementation of this policy, individuals have a very important role in cooperating with those responsible for safeguarding the environment.

5. AGROFORESTRY AND CONSERVATION OF BIODIVERSITY

5.1 OBJECTIVES

- To create a ground for multi-disciplinary research and generate employment opportunities
- To develop sustainable farming techniques and identify consumer markets for the produce

5.2 SCOPE AND ACTIONS

Agroforestry provides a different land use option as compared with traditional arable and forestry systems. It is a practice that supports the environment and makes better use of environmental resources. Due to the increase in population of humans and domestic cattle in developing countries like India, there is a corresponding increase in the demand for food and fodder. The burden of an increasing population further puts pressure on cultivable land leading to a decline in the cropland per head thereby lowering the scope of food production by increasing the area under cultivation. Assam Don Bosco University has adopted Agroforestry since it is more supportive of biodiversity than mono crop systems and is a means to produce food from marginal agricultural land and to also maintain and improve the conservation of biodiversity.

In its endeavour for conservation of healthy ecosystems, the University has embarked on a plantation drive spread over 190 acres of its Campus at Tapesia. The variegated cropping of tea, coconut, rubber, cocoa, cashew-nut, agar, ginger, and turmeric have been established as livelihood projects within the scope of demonstration farms and seed gardens to demonstrate and promote scientific research in crop development and inter-cropping. Once they start

yielding, the University will promote such plantations in the villages and facilitate Farmers' Cooperatives providing them with the managerial and marketing expertise needed for their success. Marginal strips of unused land at the Azara Campus are used for a small kitchen garden, and for planting bananas and papayas. The University has its own Mushroom Cultivation Unit which cultures Oyster Mushrooms for the purposes of research, consumption, and revenue generation.

- **Research:** Since the plantations will be situated inside the University Campus, it will facilitate multi-disciplinary research work. Research will be an integral part of the project and will focus on areas like establishment of a medicinal and aromatic plantation, agronomic practices and their environmental impact. This will help strengthen knowledge about the crops across different aspects of cultivation and lead to economic sustainability to the grower with an assurance of regular supply.
- **Employment:** The adoption of agroforestry practices creates employment opportunities in management of seedling farms for the recommended tree species, increased labour for pruning and harvesting of wood and other by-products from the plantations. People of the nearby villages in possession of arable land will be able to convert their property into meaningful self-employment resources as well as be able to generate employment for others. This will also provide part-time employment opportunities for the students of the University.
- **Promotion through co-operatives:** The land around the University Campus is predominantly agrarian and formation of farmer cooperatives will be facilitated by the Department of Social Work for collaborative programmes in conducting awareness camps regarding tea, cocoa, rubber, cashew nut, coconut, ginger, and turmeric; their production, financial viability and profitability and income generation.
- **Demonstration Farm:** Frontline Technology Demonstration Farms, within the University with new and sustainable farming techniques will demonstrate the utility of the produce and the financial possibilities of variegated agroforestry to the students, their parents and visitors to the University. Further, well planned plantations inside the Campus will be an added attraction for those visiting the University.
- **Marketing and networking:** The School of Management will be involved in creating business strategies involving marketing and marketing for promotion of growth of cocoa, rubber and cashew nuts in the region.

6. MANAGEMENT OF WATER CONSERVATION AND SUPPLY

6.1 OBJECTIVES

- To meet water supply requirements of the Campus through a sustainable approach
- To ensure judicious use of water resources through rain water harvesting (RWH) and groundwater recharge

6.2 ACTIONS

6.2.1 Meeting Water Demands

To meet the water demands of the University, it has adopted several strategies-

- It has created a major reservoir, spread over 10 acres, with an average depth of 30 feet, by tapping a small stream passing through the Campus and the many natural springs in the adjoining creeks.
- It has created five more minor reservoirs that together cover an area of 11 acres and have a depth of 15 to 20 feet, by the creation of embankments that trap the water of existing permanent springs.
- While the reservoirs help in water harvesting, stormwater management and replenishment of the groundwater table, the University has also invested in five deep-bore wells to supply drinking water through a network of three water tanks with a capacity to store 7,00,000 litres at a time. Check-gates has been set up to check the level of access water during the flood season.
- The master plan of the Campus provides for three more check dams to ensure that the water resources in the Campus are well controlled, managed and utilized.

6.2.2 Judicious Use of Water

The University has invested significant resources to ensure sustainable water management and use through storm water management and water harvesting.

Whilst the University will endeavour to make efficient and environmentally responsible use of water, every effort will be made to identify opportunities for water reuse. The options for water reuse may include-cleaning offices, gardening, washing vehicles, and cultivation.

- The University has a large expanse of pervious land to ensure groundwater recharge. Pervious walkways are provided all over the Campus to allow water to percolate and to reduce runoffs.
- The terraces of the building have percolation pits that channelize the rainwater to the ground via recharge pits.
- Storm drains are constructed to drain excess rainwater from impervious land surfaces.
- The University collects samples of water from Campus streams and lakes and tests them for chemicals that are indicators of storm water pollution. The water samples collected from the streams and lakes are tested in a Government approved laboratory. Monitoring Campus streams and lakes helps identify water quality problems and the causes of these problems including ensuring check on disposal of pollutants such as paint, soap or oils.
- The Assam Don Bosco University Project of “**Bixudha Jol Asoni**” (Clean Water) aligns with **United Nations Development Goal 6 of Clean Water and Sanitation** to ensure access to water and sanitation for all. The reason for this project is the non-availability of pure drinking water, mostly in the rural areas during the rainy season and also the reported presence of fluorides and arsenic in the ground water in the North Eastern part of India. The objective of the project is to develop water purification systems that utilize green technology and solar energy for activation.
- The University has undertaken planting of water purifying plants such as Tulsi (Indian

Basil), Moringa and Prickly Pear Cactus for environment friendly treatment of wastewater.

- The University uses mycoremediation as a tool to treat sewage water.
- Chemical discharge and wastewater are subjected to treatment before they are released. Inorganic waste such as concentrated acidic or alkaline solutions are neutralized before disposal. Sodium bi-carbonate or Calcium oxide (lime) is used for the neutralization process so that the neutralized liquid contains no harmful substance.

7. WILDLIFE MANAGEMENT

Care is taken by the University in protection of wildlife and their habitat. The University will extend opportunities for nature education to students and communities living in the vicinity of the Campus to inculcate respect for conservation of wildlife and their habitat.

7.1 OBJECTIVES

- To document the flora and fauna in the Campus for studying and minimising the impact on wildlife and vegetation with an emphasis on preparation of a list of species available in the Campus with special reference to endemic and IUCN Red List of threatened species
- To maintain a continuous forest cover and uninterrupted animal corridors in order to reduce human –animal conflict
- To maintain the grounds and buildings of the University in an environmentally sensitive way, seeking to protect and enhance natural habitats and biodiversity
- To explore alliances for collaboration in conservation programmes for threatened species
- To control the spread of invasive species in open areas

7.2 ACTION

A record of tracking endemic and IUCN threatened species on Campus and in the vicinity of the Campus has been undertaken by the Department of Zoology.

- The students and faculty of the University play an active role in inventorizing and monitoring the existing flora and fauna on the Campus and its vicinity.
- In order to allow unhindered movement of elephants and other wild animals for their access to water and foliage available in the Campus, no walls or fences are erected rather only boundary pillars are used to demarcate the land of the University. No one is allowed to hunt or harm wild animals in the Campus.
- Students of the School of Life Sciences are also engaged in Conservation and Management of the existing ecosystem through a one-year intense Project as part of the curriculum. Every year, students are taken to a Nature's Trail (a trekking event both in-campus and off-campus) where they are taught about the Do's and Don'ts when entering a forest.

- Every year, the University participates in the annual Campus Bird Count event which is a part of the international event, Great Backyard Bird Count.
- The University celebrates World Animal Day every year through the organisation of activities which promote the welfare of animals.
- Awareness programmes, Workshops, Seminars and Conferences are organised every year for involving the youth towards wildlife conservation and management.
- The infrastructure of the University is built in an eco-sensitive manner taking into account the natural landscape and the environment in order to protect and live in harmony with the wild flora and fauna. The University conducts Plantation Drives within the Campus to increase the forest cover.
- The University collaborates with external agencies to equip the members of the faculty, staff and student community to solve environment related issues.
- The University periodically removes invasive plant species like *Mikania sp.*, *Ageratum sp.*, *Mimosa pudica*, *Chromolaena sp.* to control their spread in the tea gardens.

8. MANAGEMENT OF CLEAN AND AFFORDABLE ENERGY

8.1 OBJECTIVES

- To demonstrate genuine efforts to achieve energy efficiency and promote good practice of energy conservation
- To support innovative and novel projects engaging with staff, students and stakeholders
- To integrate energy efficiency strategies into our Campus operations and make energy efficiency concerns a part of our curriculum and research.

8.2 ACTIONS

The University is committed to generation of Clean and Affordable Energy – Sustainable Development Goal 7:

- The infrastructures are built in a manner that relies more on natural light, thereby reducing dependency on artificial lighting.
- The University has installed 320 KW grid-connected solar photovoltaic power systems by using the free rooftop spaces which is estimated to reduce the energy cost incurred by the University by 16-20% on an average.
- Water reservoirs have been created utilising the natural streams coursing through the Campus and the installation of a facility for generating micro hydel power up to 10 KW is under way.

9. WASTE MANAGEMENT

9.1 OBJECTIVES

- To set and achieve targets for reducing resource use
- To minimise the adverse environmental impacts of the disposal of University assets
- To increase the rate of recycling of all appropriate material, based on its life-cycle
- To implement sustainable resource management practices, based on 5R's principle

9.2 ACTION

Assam Don Bosco University is committed to “zero waste” and reducing the environmental impact of its activities through its philosophy of 5R's- Refuse, Reduce, Reuse, Repurpose, and Recycle. Thus, a prudent budgeting approach is adopted in what we purchase as a first step towards reducing waste. The segregation of waste is the key strategy for waste management and uses dedicated space for segregation, storage, re-use, recycling and disposal. The recycling scheme includes office stationery, examination answer scripts, electronics, laboratory material and furniture.

- **Solid waste management:** Bins are provided throughout the Campus to segregate solid waste with signage - Plastic Only and Non-plastic. Plastic waste is collected and sold to an agency that re-cycles plastic. Non-plastic is segregated into organic bio-degradable and others.

Organic bio-degradable is used for vermicompost preparation. The kitchen waste is collected from all the hostels, biodegradable materials shredded and mixed with cow dung and fed to a widely used earthworm species known as *Eisenia fetida* in a tank. Grass cut from the lawns is also fed into the tanks. The final product is vermicompost, organic manure, utilized for agricultural application. The entire tea plantation of 120 acres on the Campus uses organic manure: the vermicompost produced from the bio waste of the University campus.

Other waste materials (like paper, cardboard, bio-medical waste, etc.) are efficiently converted into ash in a magnetic high-temperature smokeless incinerator installed in the Campus.

Kitchen waste is collected by the canteen staff and is taken away to feed pigs in a pig farm.

- **Liquid waste management**

Waste water from wash-basins is channelled into drains and then into small streams. Flowing down the drains and streams water is naturally oxygenated and purified.

The waste from the canteens and other areas are channelled into a reservoir for biological treatment using magur fish, acting as scavengers, before the water goes out into river bodies.

- **Hazardous chemicals waste management**

Chemicals flowing out through the drains of the laboratories are made to pass successively through a waste Management system that consists of Chamber-I (Gravel), Chamber-II (Sand) and Chamber-III (Charcoal). The water flowing out from Chamber-III is free from hazardous chemicals and is lead to a soak pit. The three chambers are replenished with new materials after a period of six months.

The solvents used in the laboratories are reused after distillation to minimize the use of solvents. The waste solvents are separated as halogenated and non-halogenated in plastic

containers. To prevent heat generation and gas evolution or other reaction, compatibility of the waste is checked carefully.

Halogenated and non-halogenated solvents are stored separately in designated plastic drums. After the drums are full, the State Pollution Board is contacted for collection and destruction.

- **e-Waste management:** Segregation is the first step for disposal of e-waste. Our university is collaborating with Karo Sambhav, an e-waste Producer Responsibility Organisation (PRO). Karo Sambhav, on invitation by our University makes presentations to the university community, for creating awareness for managing e-waste. Karo Sambhav removes all e-waste from our Campuses on request.

10. CAMPUS PLANNING AND ARCHITECTURE

The principles set forth here are intended to establish and enhance Assam Don Bosco University's status as having one of the preeminent verdant collegiate settings in the country. They encourage a walkable, gracious and sustainable Campus environment based on merging with its natural surroundings and mesh the University with its surrounding neighbourhood.

The principles address the following:

- **Usage**

- i. Designing residential schools as self-contained, multiple-use residences with unique identities, while emphasizing their relationship with, and connections, to open streets and spaces
- ii. Providing recreational amenities and services geared to the Graduate and Post-Graduate Student population
- iii. Consolidating academic divisions as well as facilities of individual professional schools to increase efficiency and maximize convenience for both faculty and students
- iv. Employing design strategies such as the use of landscaping and similar building scale, massing and materials to ensure compatibility with the natural surroundings
- v. Promoting arts, entertainment and retail activities for the University and the neighbouring area by designing facilities with active usage at the ground level
- vi. Supporting local structure such as physical plant and grounds maintenance, at the perimeter of the Campus, where they can meet functional and circulation needs more easily

- **Buildings**

- i. Designing buildings to shape open spaces rather than merely sit as an object in them
- ii. Encouraging mixed use development and buildings with active ground level use
- iii. Orienting building entrances towards those streets or walkways that support the primary pedestrian system within the area and throughout the Campus

- **Open Spaces**

- i. Recognizing the idea of open space on Campus – including roads, walkways, quadrangles, courtyards and gardens – when creating new spaces and preserving existing ones
- ii. Preserving landscape settings on Campus while accommodating the demand to use some actively for gatherings, ceremonies and recreation
- iii. Creating a safe, mixed-traffic bikeway system by slowing traffic, marking preferred cycling routes and adequate bicycle parking facilities

iv. Promoting clear and visible pedestrian connection through all Campus streets

- **Streets**

- i. Supporting efforts to convert streets to two-way traffic to improve pedestrian environment
- ii. To keep in mind that sidewalks are the primary pedestrian system on Campus when designing street rights of way
- iii. Encouraging on-street parking on every street to slow traffic, thereby increasing pedestrian safety and adding convenient parking

- **Signage**

Comprehensive, coherent and consistent signage throughout the University that properly expresses its academic and cultural missions

- i. Welcome Assam Don Bosco University visitors, regional residents, tourists, potential students, new students, faculty and staff, while helping guide them to destinations within the University Campus
- ii. Creating an image of the University that expresses the Don Bosco background as well as its importance as a contemporary centre of culture, research and academic activity
- iii. Creating a wayfinding system that integrates with the surrounding landscape, architecture and urban environment
- iv. Creating a signage system that is flexible and adaptable to diverse situations

- **Lighting:** The Campus at night should support both safety and aesthetics, the Campus can be as memorable at night as it is during the day

- i. Developing a lighting system that illuminates destinations and reduces glare between those destinations
- ii. Prominently lighting building entrances or ground floors, important architectural features and supporting landscape elements to reinforce the pedestrian system throughout the Campus
- iii. Selectively lighting higher buildings and other prominent, tall structures to create a rich skyline at night that helps provide direction and improves orientation within the Campus
- iv. Installing lighting in parking lots and garages, for comfort and security, but with minimal glare to the immediate surroundings

10.1. DESIGN FOR REDUCTION OF ENERGY CONSUMPTION

To minimize the use of air-conditioners and save power, one of the Academic Blocks has been built on the model of a German architectural design wherein underground air tunnels are connected to air flow ducts in the building. This keeps the building cool from inside and thereby eliminates the need for air-conditioning. If found to be beneficial, this model is expected to be replicated all through the Campus.

11. LEADERSHIP IN PROMOTING ENVIRONMENTAL PROTECTION IN THE COMMUNITY

Assam Don Bosco University will drive an outcome-based approach through its vision, mission, values, research, teaching- learning and practices in implementing Education for Sustainable

Development to bring about change and social transformation impacting communities and environment in partnership with multiple stakeholders of community, government, industry and non-government organisations. The endeavour of the University has been to cascade a design thinking approach in its educative processes to inculcate in students the critical skills of empathy, collaboration, persisting through failure and being comfortable with ambiguity.

Assam Don Bosco University, will use a multi-pronged strategy to address issues of poverty, health, education, drinking water, cleanliness and gender disparity which is aimed at achieving national development in its implementation of a green university concept.

12. SIGNIFICANCE

Of paramount importance in this policy are the following:

- Introducing into the vision of the University a clear mandate to bring about social change as one of its key objectives.
- Designing a comprehensive master plan for the Campus to avoid haphazard developments and constructions, and to insert eco-consciousness into every aspect of the University's life.
- Ensuring the involvement of faculty and students in the planning and implementation of an eco-friendly Campus to bring about attitudinal changes that translate into social impact as they in turn enrich their own communities.