



Eco-Friendly Campus Policy (Ver.1.0)

[Conservation of healthy ecosystems and sustainable farming]

["Creating and Sustaining an Eco-Friendly Campus with clear cut goals and priorities in the management of water resources, energy sources and consumption, preservation of flora and fauna, conservation of eco systems and wildlife, and productive use of the land."]



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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.

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, every year, the existing archaic drainage management of the campus created major flooding and erosion.
- **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 called 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 bio diversity by maintenance of the natural environment.
- 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.
- Protection and conservation of the species of flora and fauna endemic to the campus and preservation of their natural habitat.
- Involving local communities in the custodianship of natural resources.

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 co-operating with those responsible for safeguarding the environment.

5. AGROFORESTRY AND CONSERVATION OF BIODIVERSITY

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, cocoa, 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.

5.1. SCOPE

- **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 breeding of the plant, agronomic practices and the 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 labor 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 nut in the region.

6.MANAGEMENT OF WATER CONSERVATION AND SUPPLY

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

- 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 minor reservoirs, each of an acre or more in area and 15 to 20 feet in depth, by the creation of embankments existing permanent springs.
- While the reservoirs help in water harvesting, storm water management and replenishment of the ground water 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 liters at a time.
- 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.

6.1. WATER REUSE

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
- Cultivation

6.2.ACTION

- 6.2.1. 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.
- 6.2.2. 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 and also reports about the presence of fluorides and arsenic in the ground water in the North Eastern part of India. The objective of the project is to develop green water purification systems that utilize solar energy for activation. Solar energy is freely available in abundance and each and every person has access to it. The objective of this project is to provide low cost pure drinking water providing systems which will positively affect the health of the people. A healthy and strong base of the social pyramid will ensure development of this otherwise backward region.
- 6.2.3 Under the scheme of **“Bixudha Jol Asoni”** (Clean Water) , water samples were collected from the 12 villages of Jogdal, Upper Tapesia, Patarkuchi, Medhikuchi, Nam Tapesia, Goriaghuli, Nazirakhat, Morangabari, Kalitakuchi, Jargaon, Chagoligaon and Hatimura. The nanotechnology based solar powered water purifiers were custom designed by the Centre of Excellence in Nanotechnology for installation in each of these villages.
- 6.2.4 The activities undertaken by the University under the “Swachh Bharat” (Clean India) Mission have facilitated awareness of the **“Bixudha Jol Asoni”** (Clean Water) scheme of the University and included:
- i. Cleaning and renovation of 27 Anganwadi centres and building of toilets
 - ii. Distribution of Indigenously designed solar-powered water-purifiers at the University, having light-activated semiconducting nanomaterials that are capable of removing both chemical and biological contaminants from water.
 - iii. Over 1000 children have been sensitised on health, hygiene, harmful effects of plastic-usage and sanitation issues in the community.
 - iv. Over 20 training programmes for women on menstrual hygiene, language skills, numerical skills, child development, parenting, health, rights, responsibilities and government schemes.
- 6.2.5 The **“Bixudha Jol Asoni”** (Clean Water) scheme of the University highlighted the necessity of conservation of water including awareness of potential uses of waste water in irrigation among community members in the adult literacy classes and workshops on sanitation and health conducted by the University.
- 6.2.6 On an average there are 250 families in each village, with 4.5 members in a family. Hence the population covered is approximately 13,500 in about 3000 families under the scheme of **“Bixudha Jol Asoni”**.
- 6.2.7 The University has undertaken planting of water purifying plants such as Tulsi (Indian Basil), Moringa and Prickly Pear Cactus for environment friendly treatment of waste water.

- 6.2.8 Polluted water of the University is subjected to treatment before release. The liquid waste is segregated into organic and inorganic waste. 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. The organic waste yield of the University is limited till date and therefore treated with cow dung for decomposition due to the action of micro-organisms.

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 allow for the unhindered movement of elephants and other animals inside the campus, and their access to water and foliage, only boundary pillars are used to demarcate the land of the University – no walls or fences.
- No one is allowed to hunt or harm animals and birds in the campus.
- Project by University faculty and students to map the flora and fauna in the campus to study and minimise the impact on wildlife and vegetation
- Prepare and record a checklist of species available in the campus has been prepared with reference to endemic and IUCN list of threatened species
- To ensure contiguous forest cover for the wildlife sanctuary in its vicinity and ensure an undisturbed animal corridor
- Maintaining the grounds and buildings of the University in an environmentally sensitive way, seeking to protect and enhance natural habitats and biodiversity.
- Explore alliances for collaboration in conservation programmes for threatened species

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, School of Life Sciences

8. MANAGEMENT OF CLEAN AND AFFORDABLE ENERGY

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

8.1. ACTIONS

- 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% at an average on a monthly basis.

- 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.
- The University is engaged in research of other renewable sources of energy in the requirement of total energy mix and is engaged in research such as “Optimization of DC Microgrid for Renewable Energy Integration”, in which a dc microgrid for optimization of renewable power integration has been proposed, analysing the possibility in optimizing the utilization of renewable energy sources within microgrids. Renewable power from wind and solar generation forecast have been aggregated and it has been proposed to support the quantification of the operational reserve and maintain the equilibrium of the microgrid’s real-time supply and demand.

8.2.OBJECTIVES

- Demonstrate genuine efforts to achieve energy efficiency and promote good practice
- Support innovative and novel projects engaging with staff, students and stakeholders
- Integrate energy efficiency into our policy-making in relation to campus operations, curriculum, and research.

9. WASTE MANAGEMENT

Assam Don Bosco University is committed to “zero waste” and reducing the environmental impact of its activities through its philosophy of “reduce-reuse-recycle”. A prudent budgeting approach is adopted in what we purchase as a first step towards reducing waste. The University’s recycling scheme has included office stationery, electronics, laboratory material and furniture.

9.1. ACTION

- Solid waste: Waste produced during course of normal operation and can be disposed of via Recyclable, General and Mixed waste bins. The entire tea plantation of 120 acres on the campus is organically nurtured from the vermicompost produced from the bio waste of the University campus. Vermicompost is produced at the campus from the bio waste matter of the University as organic nutrients for the plantations with the firm endeavour of promoting recycling of waste and dissemination of the practice of organic farming. The eco-friendly waste management system involves a magnetic flux created with controlled oxygen presence which ensures the complete combustion of waste decomposing municipal solid waste material into ash. During the destruction process there is no odour, flies or leaching of contaminants
- Liquid waste: The University adheres to a strict protocol of liquid waste disposal in its laboratories. Any glassware used in the laboratory is rinsed with minimum water and placed in the liquid waste container. The liquid waste is segregated into organic and inorganic waste. 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. The organic waste yield of the University is

limited till date and therefore treated with cow dung for decomposition due to the action of micro-organisms.

- E-waste: The University has optimised its inventory of 577 computers through reassembling, modification and upgradation by the University's own team of IT Administrator, faculty members and students of Computer Science Engineering and Information Technology. This has been a critical endeavour towards E-waste management ensuring that no discarded computers or printers are lying idle in the office premises. This E-waste drive has also benefitted the social commitment programme, "Swabhalamban" by training unemployed youth in maintenance of computers.

9.2.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 reduce, reuse, recycle and recover principles.

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. Design residential schools as self contained, multiple-use residences with unique identities, while emphasizing their relationship with, and connections, to open streets and spaces
 - ii. Provide recreational amenities and services geared to the Graduate and Post Graduate Student population
 - iii. Consolidate academic divisions as well as facilities of individual professional schools to increase efficiency and maximize convenience for both faculty and students
 - iv. Employ design strategies such as the use of landscaping and similar building scale, massing and materials to ensure compatibility with the natural surroundings
 - v. To promote arts, entertainment and retail activities for the University and the neighbouring area by designing facilities with active usage at the ground level
 - vi. Locate support 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. Design buildings to shape open spaces rather than merely sit as an object in them
 - ii. Encourage mixed use development and buildings with active ground level use

- iii. Orient building entrances towards those streets or walkways that support the primary pedestrian system within the area and throughout the campus
- Open Spaces
 - i. Recognize the idea of open space on campus – including roads, walks, quadrangles, court yards and gardens – when creating new spaces and preserving existing ones
 - ii. Preserve landscape settings on campus while accommodating the demand to use some actively for gatherings, ceremonies and recreation
 - iii. Create a safe, mixed-traffic bikeway system by slowing traffic, marking preferred cycling routes and adequate bicycle parking facilities
 - iv. Promote clear and visible pedestrian connection through all campus streets
- Streets
 - i. Support effort 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. Encourage 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. Create an image of the University that expresses the Don Bosco background as well as its importance as a contemporary center of cultural, research and academic activity
 - iii. Create a way finding system that integrates with the surrounding landscape, architecture and urban environment
 - iv. Create 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. Develop a lighting system that illuminates destinations and reduces glare between those destinations
 - ii. Prominently light building entrances or ground floors, important architectural features and supporting landscape elements to reinforce the pedestrian system throughout the campus
 - iii. Selectively light higher buildings and other prominent, tall structures to create a rich sky line at night that helps provide direction and improves orientation within the campus
 - iv. Install 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 stake holders 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 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.