Award Category – Extension Outreach Programs (to be filled by authorized representative of the Participating Institution)

Award for – Institutions

Important Note:
All work should be available on Institute's official website or other appropriate portals. Participants need to share all applicable digital links for the work done under this category. Pls visit award criteria mentioned on www.bharatshikshaawards.com before submitting this form.

Duly completed form to be submitted by August 15, 2022. Pls read terms and conditions on www.bharatshikshaawards.com before submitting your response.

Email *

singh.suresh86@yahoo.com

Email id *

singh.suresh86@yahoo.com

Full Name of the person filling the form *

Dr Rajkumar Suresh Singh

Name of the Institute / University *

Manipur University

Designation, email address, mobile # *

Assistant Professor, singh.suresh86@yahoo.com, +918730909363

Which Extension Outreach activities did you organize? *

Adult Literacy

Provide details of Unnat Bharat program, enrolment of students in NCC and NSS. *

not applicable

Provide details of the Villages adopted and initiatives undertaken for the betterment of the villages. *

Various villages at Imphal West District, Imphal East District, Thoubal District and Senapati District of Manipur. (Presently, adult literacy classes at Mongshangei Village, Imphal West, Manipur)

List out the Green initiatives undertaken by the institution in word format with proof of improvement. *

muTheGreenAud...

Provide details of Blood Donations camps organized by the Institution. *

Various Blood Donations by NSS Cell, Manipur University

Provide details of any other Outreach program / activities conducted by the institution. Provide link of college's website to justify claim. *

https://www.manipuruniv.ac.in/news/tree-plantation-at-manipur-university

GREEN AUDIT REPORT

2020-2021

MANIPUR UNIVERSITY
(A CENTRAL UNIVERSITY ESTABLISHED BY AN ACT OF THE PARLIAMENT IN '2005')
INDO-MYANMAR ROAD, CANCHIPUR, IMPHAL, MANIPUR, INDIA, 795003
www.manipuruniv.ac.in

Vice-Chancellor

Manipur University
Canchipur
Imphal-795003
Manipur, India

Dated 11th March 2022

FOREWORD

Green Audit is a process of evaluation of the environment in which systematic identification, quantification, recording, reporting and analysis of the diverse components of the environment are considered in an organized sequential manner for assessment. Green audit practically takes into account the use of renewable sources, energy conservation, inventorying the flora and fauna, planting of trees, approach to carbon neutrality, rain water harvesting, E-waste management and disposal methods of hazardous wastes. All the above initiatives are taken with the sole objective of improving the conditions of environment. As environmental sustainability is an important issue for the nation, educational institutions play a pivotal role in imparting knowledge about energy and water conservation, waste management, etc., through certain ecologically viable and acceptable methods. For this reason, in the recent years, green audit has become mandatory for NACC assessment in all the academic institutions affiliated to UGC. Moreover, campus green auditing will enable the students to know about their campus in terms of sanitation, hygiene and cleanliness necessary for their healthy life besides, understanding the measures taken up by the university in maintaining the premises as an institution with pristine ecosystem. This enterprise will also encourage the students to protect the planet and in turn, students will be motivated to become responsible citizens of the country. Green audit and sustainable development will help in reducing wastage and associated cost, besides, enhancing the product quality. In this context, I wish to emphasize that Manipur University has implemented a number of eco-friendly green initiatives and a consolidated version of such activities is presented in this report. I appreciate the efforts taken by the Green Audit Committee of our university in presenting the data related to green energy and clean environment of the campus and these details along with its recommendations will, indeed, enable us to improve further especially in planning and execution of green technology for the development of the university in the years to come.

(Prof. N Lokendra Singh)
Vice-Chancellor

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PREFACE

Green energy and a green environment have become the need of the day in the Globe. Any area we inhabit and any process we undertake is expected to be green and clean coupled with ways and means of saving energy. The indices for green and clean environmental assessment of a particular area constitute the composition of dense flora and fauna, clean water, pollution-free air, recycling of wastes, and different mechanisms of saving energy and water. Although our University has gathered the data about specific aspects mentioned above from its inception, a maiden attempt to provide an integrated and almost comprehensive database about the university campus has been made possible by the first-ever Green Audit Committee (Annexure 1). Thanks are due to Prof. N. Lokendra Singh, Hon'ble Vice-Chancellor of Manipur University, who constituted this committee in 2021-2022 and encouraged the members to have a free and fair discussion on the topic to maintain transparency in projecting the data pertaining to diverse environmental parameters. The GAC would like to express gratitude to the Registrar, MU and HODs of different departments for sharing their data, which enabled the GAC to present the actual and valid data.

An appraisal of the biodiversity of the campus revealed an appreciable density of nearly 380 plant species and nearly 410 species of animals in the total area of 287 acres. The sweet chirping sounds of the exciting birds in the morning; the mesmerizing movement of beautiful butterflies during the day; the colorful blossoms of the campus gardens; the stretches of green lawns displaying as green carpets and the fencing plants akin to green pillars; all demonstrate that the university campus still maintains the natural beauty of a pristine ecosystem within the Indo-Myanmar biodiversity hotspot. Further, the slight slope of campus terrain with a hillock at the southern side, a central water canal at a stretch of 2-3 km, and its location at Canchipur village, which is at least 7 km away from Imphal city make it possible to maintain the scenic splendor of the campus. The fertile soil and suitable water table result in the luxuriant growth of plants, which provides shelter, food, and breeding province to a number of animals. This sequential process is evident in this report while assessing the biodiversity status of the university campus.

The green campaign activity of the students *viz*., afforestation programme, awareness camps, drawing competition, debate on environmental issues, seminars and symposia concerned with climate change and involvement of campus dwellers in banning plastic and polythene bags, organic cultivation of vegetables within the campus, expending the library with e-books and e-journal resources, frequent social work activities extended by different sections of the campus inhabitants, promoting solar-based sources of energy, replacement of conventional electrical light by LED bulbs and frequent use of cycles by the students for their mobility within the campus, etc., reflect the responsibilities and commitments initiated by the university authorities to maintain the campus eco-friendly.

I am totally optimistic that the observations and recommendations presented by the Green Audit Committee would pave the way for the growth of the University in a sustainable way by adopting more and more ecologically sound and environmentally viable methods for the health of the people and the environment in the campus and beyond.

Prof. R. Varatharajan,
Chairman, GAC, MU

CONTENT

1. INTRODUCTION

Manipur University was established in 2005 by an Act of Parliament. It functions as a Central university providing academic service to the National and International students. It is situated on the Asian Highway-2 (GPS coordinate: N 24.751306, E 93.927449) which is commonly known as the Indo-Myanmar Road in Imphal, Manipur. There are about 5000 students and research scholars together forming the students' community of the University, with nearly 250 teaching faculties and 150 non-teaching personnel. To fulfill the academic interest of the students and faculties, the University offers a wide range of courses in as many as 47 departments under nine schools. With the prime objective of providing infrastructural support to the tune of over 7000 individuals including students, staff and their families, the University extends help from the administrative block by having an array of departmental buildings, guest houses, hostels, residential quarters, banks, post office, health center, playgrounds and children parks in a total area of 287 acres. To facilitate the space for daily visitors, the University has established parking zones, canteens and resting places. For the effective functioning of these infrastructural components for the service of the campus people, the University requires an uninterrupted power supply (electricity), good quality water, waste-free habitat, and pollution-free atmosphere. In order to accomplish and achieve the above goals, the University strives at implementing the best practices by following the concepts of green development, green-building, clean-energy, waste-recycling, waste to wealth with an emphasis on eco-friendly approach in a sustainable way. It is heartening to note that some of the best practices are implemented in the campus with the help of both government and non-government agencies.

The green auditing exercise is an essential component of the Annual Quality Assurance Report (AQAR) of the Internal Quality Assurance Cell (IQAR) of the concerned University and the information presented herein relates to the infrastructural and environmental components besides, the best practices being followed by the University under the vision and mission on eco-friendly academic services to society and the nation. It has documented not only the present status of campus flora, fauna, green energy and environmental quality parameters but it also envisioned the future course of action of the University administration in tune with eco-friendly and sustainable development of the University campus.

2. METHODOLOGY

The Green Audit of Manipur University was performed by the Green Audit Committee (GAC) constituted by the Hon'ble Vice Chancellor of the University. The parameters required to assess the green audit were finalized based on the AQAR guidelines, covering the information related to energy, environment, and water quality, besides disposal methods of waste materials within the premises of the University. Particular focus was given on documentation of renewable and sustainable energy practices.

In order to collect the information related to green energy and environment from diverse departments, centers, the administrative block, the library, the hostel, residential quarters, the health center, the guest house, banks, and post office of the University, an exhaustive questionnaire was prepared both in hard copy and Google form. The respective Head of the departments forwarded the information through the questionnaire.

The details on infrastructure, water, electricity, and waste management were also obtained from the university engineering section through different questionnaires.

The Department of Geography meticulously developed a detailed map related to land-use patterns and topography. The environmental quality and carbon-stock assessment were immaculately evaluated by the Department of Forestry and Environmental Science based on the standard of the Central Pollution Control Board (CPCB). Assessment of the floristic composition of the campus was attempted systematically by the Department of Botany, and the faunal diversity of the campus was impeccably documented by the Department of Zoology.

The photographs presented in this report were geo-tagged and adequate care was taken to adopt appropriate standard methods during data collection. The consolidated data on different aspects obtained through these questionnaires were analyzed and placed before the green audit committee. After a thorough discussion, the data were incorporated into this report.

3. LAND USE AND LAND COVER

The Manipur University, within its boundary, covers an area of 339 acres. It includes the protected sites under the Manipur Ancient and Historical Monuments and Archeological Sites and Remains Act (1976), which occupies the area of 52 acres. The University's estate is spread over 287 acres, under which academic buildings, the administrative block, banks, a post office, residential quarters, hostels, playgrounds, children's parks, a health center, and parking areas are established (Figure 1).

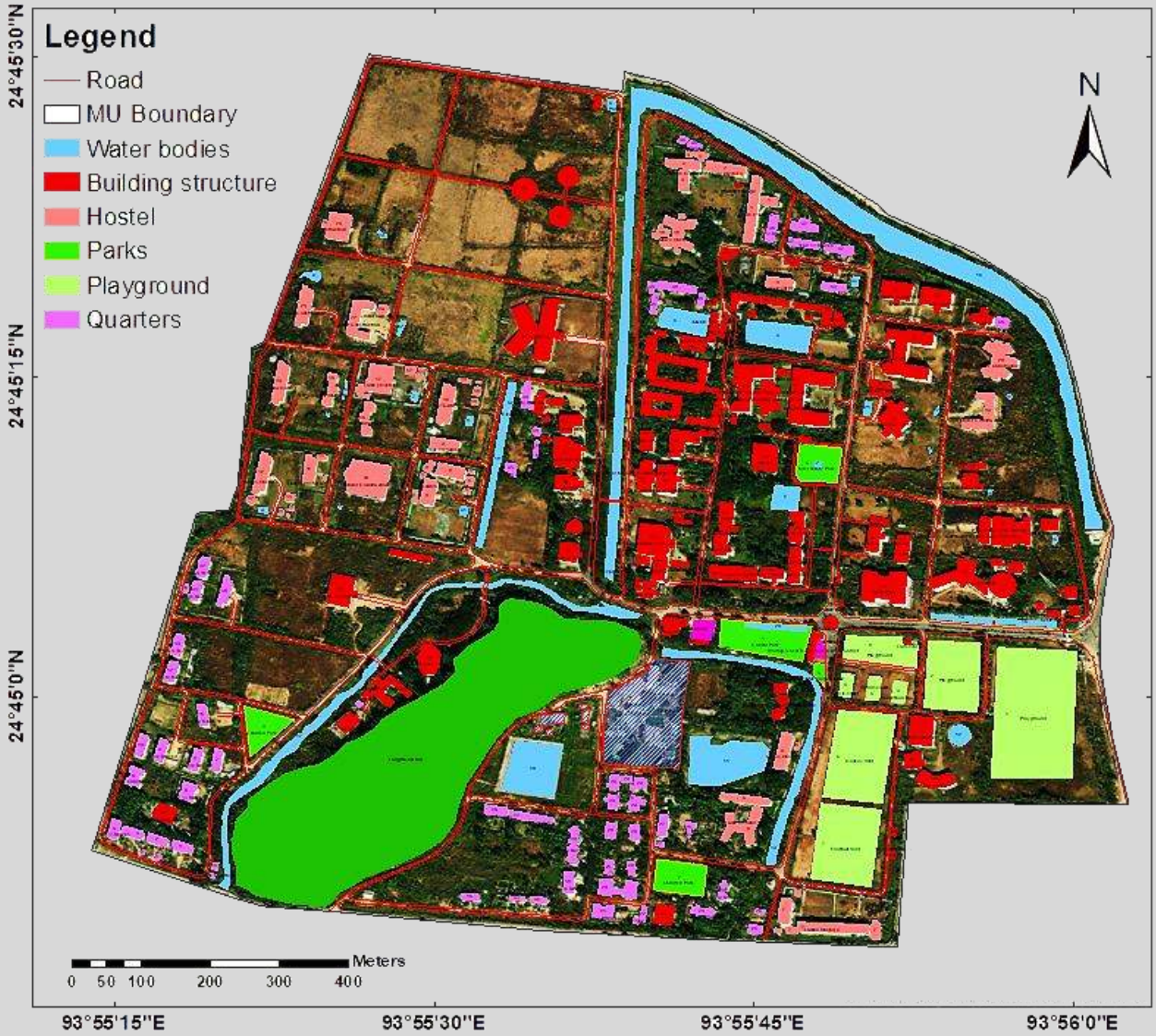


Figure 1: A base map of Manipur University for depiction of land-use pattern inside the campus (Source: Dept. of Geography)

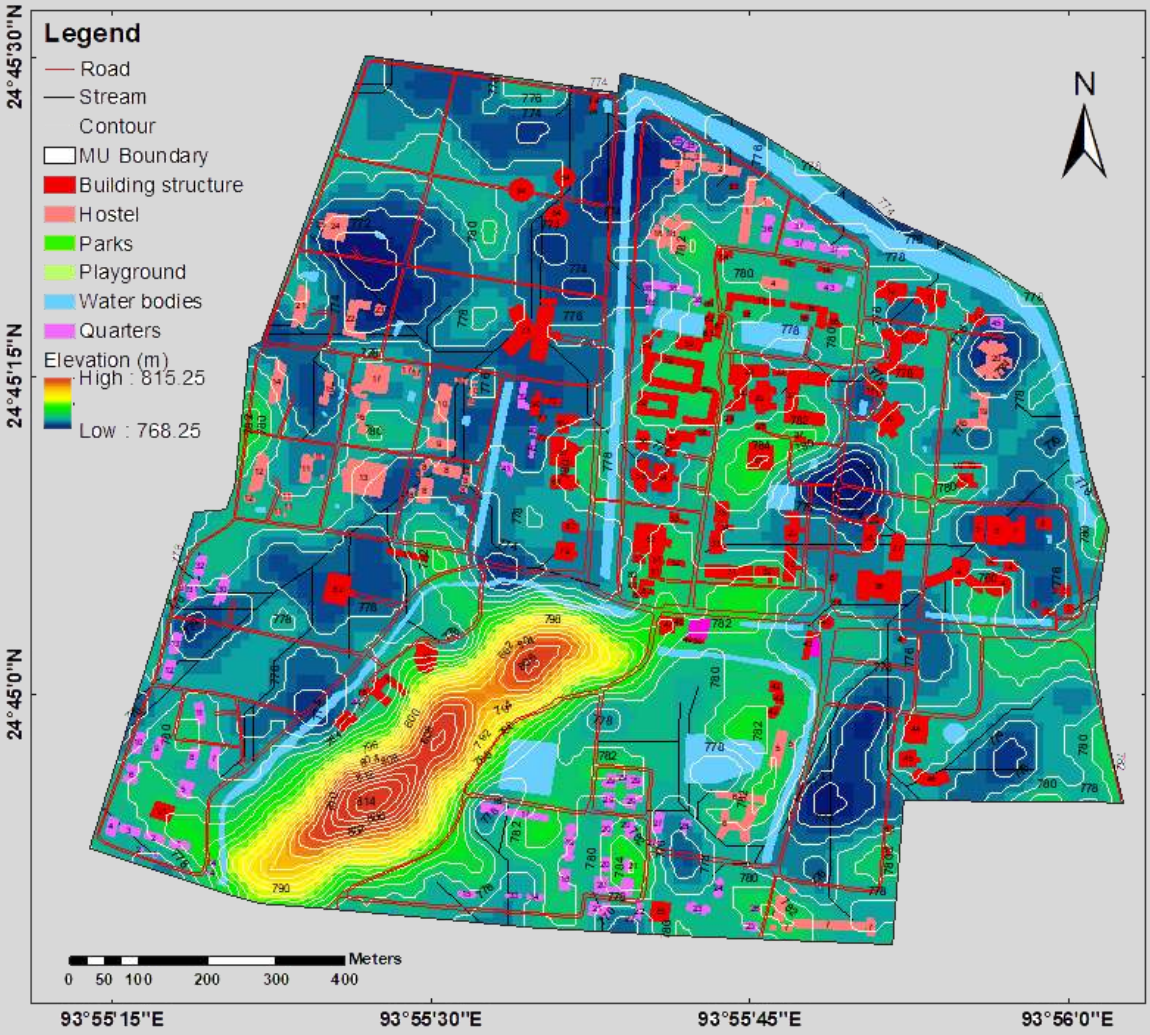


Figure 2: A contour map of the Manipur University depicting changes in the elevation inside the campus, overlayed on the outlined map as shown in Figure 1 (Source: Dept. of Geography)

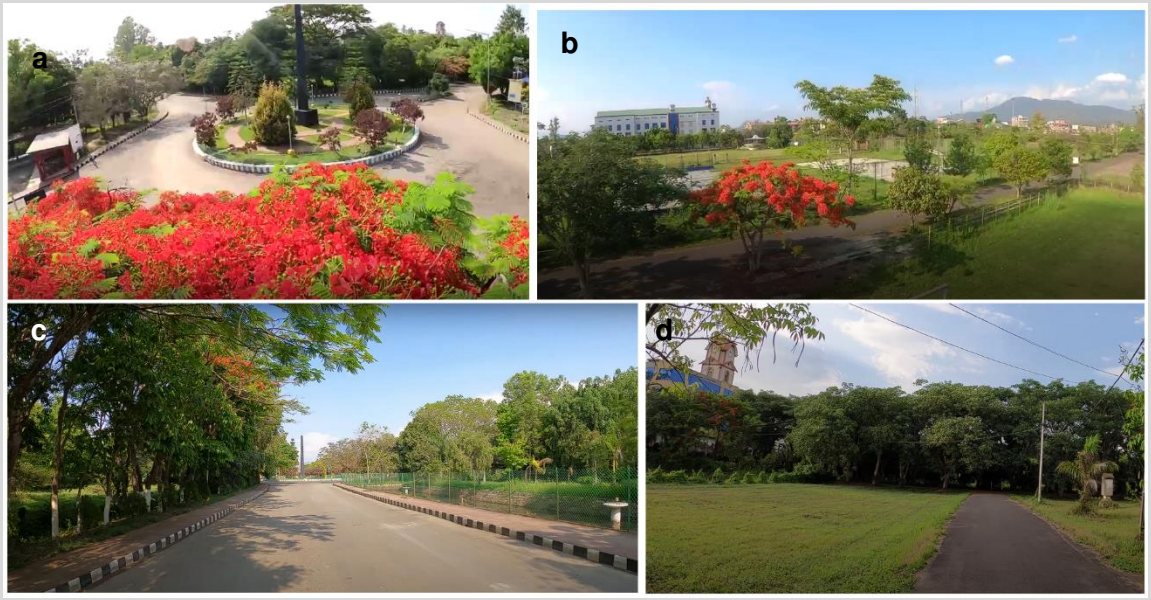
Table 1: Land-use pattern in Manipur University (Source: Dept. of Geography)

Sl. No.	Infrastructure	Construction Area / Area Occupied (Acres)
1	Academic and Administrative Blocks	15.83
2	Hostels	06.58
3	Residential Quarters	04.38
4	Parks	03.38
5	Playgrounds	12.37
6	Vehicle Parking	00.23
7	Waterbodies	14.85
8	Water Treatment System	03.68
	Total	61.30

An elevation map (Figure 2) depicts that the University land terrain covers the range from lowest 768.25 m to the highest 815.25 m level. Water bodies are formed in the lowest level and the hill (Langthabal Hill) exhibits the highest point of the elevation. As per the data provided by the Department of Geography, the academic departments, administrative buildings, banks, auditorium, and guest house altogether occupied approximately 15.83 acres of area under construction. Residential quarter blocks covered construction area of 4.38 acres. There are waterbodies inside the University premise, which occupy area of 14.85 acres. Moreover, space has been provided for vehicle parking, children parks and playgrounds as well (Table 1).

Photograph Plate 1: a. Auditorium Building, b. Guest House, c. Central Library, d. Health Center, e. Canteen Area, f. State Bank of India, g. Centenary Hall, h. Women Facility Center, i. Tennis Court, j. Playground, k. Basketball Court

4. GREEN COVER, BIODIVERSITY AND CARBON STOCK



Photograph Plate 2: Green cover of the University campus. a. Traffic square, b. Playgrounds, c. Roadside trees, d. Plantations

4.1 Floral Diversity of the Campus

The campus exhibits appreciable green-cover with deciduous and evergreen types of flora together comprising 386 species, of which timber trees and fruiting trees are 12 and 44 species, respectively (Table 2). Ornamental and medicinal trees and shrubs species constitute nearly one hundred species. These trees have been planted on the roadside, and they provide proper shade. Due to evergreen ornamental trees, the campus looks exquisite during the blooming season. The large trees provide space for medicinal herbs, climbers, and vines.

At present, 130 species of ornamental and medicinal herbs and 28 species of climber and vines have been documented in the list of campus flora. Ten species of hedge plants and 16 species of orchids and ferns are also observed within the campus. A large area of the campus is occupied by water bodies, which also support over 40 species of phytoplankton. Six species of bamboos are also present in the campus.

Table 2 Number of species contributing to the floral diversity in Manipur University campus (Source: Dept. of Botany)

Sl. No.	Types of flora	Number of the Species
1	Timber Trees	12
2	Horticultural Trees	44
3	Ornamental and Medicinal Trees and Shrubs	100
4	Ornamental and Medicinal Herbs	130
5	Climbers and Vines	28
6	Hedge Plants	10
7	Epiphytes (Orchids and Ferns)	16
8	Aquatic Plants	40
9	Bamboos	06
	Total	386

Photograph Plate 3: Glimpse of flowers depicting floral diversity of the Manipur University.

4.2 Faunal Diversity of the Campus

The floral density and diversity of the campus support a large number of faunal forms of both aquatic and terrestrial ecosystems. The Department of Zoology scholars recorded a faunistic composition of different animals.

Photograph Plate 4: Glimpse of birds, reptiles (snakes), butterflies and insects representing faunal diversity of the Manipur University campus.

Table 3: Fauna composition of the MU campus (Source: Dept. of Zoology)

Sl. No.	Fauna group	No. of Species
1	Insects	290
2	Mollusca (Snails)	03
3	Nematodes	34
4	Fishes	21
5	Amphibia	03
6	Reptiles	22
7	Avifauna (Birds)	29
8	Mammals	10
	Total Species	412

Enumeration of the species complex of the campus ecosystem revealed that the university environment harbors faunal diversity to the extent of 412 species. Among them, the insects take the lion's share of 290 species, followed by 34 species of nematode worms, 29 species of birds, about 20 species each of reptiles and fishes, ten mammals, and three species each of amphibians and Mollusca (Table 3).

Photograph Plate 5: Butterflies diversity of the Manipur University campus

Photograph Plate 6: Fish, Nematode & Insects observed inside the Manipur University campus

4.3 Carbon Stock of the campus

The floral diversity of the campus contributes to retaining the carbon in the form of wood composition, preventing its release into the atmosphere. Hence it plays the role of a carbon sink as well. The research wing of the Department of Forestry and Environmental Science has measured the above-ground biomass of 918 trees attaining a minimum height of three meters and estimated that the tree diversity of the campus had been found to retain more than 250 tons of carbon as stock in the form of the wood.

The cost of the available carbon stock was also estimated based on the carbon trading rate. The present market rate of carbon has been observed to the tune of Rs. 2500/ton. Therefore, the carbon stock maintained by trees on the campus is expected to have an economic value of Rs. 1.25 to 6.25 lakhs. This appraisal has been made for about 56 tree species present within the premises. It is projected that the Manipur University campus might contribute to carbon sequestration worth Rs. 2.0 lakhs per day extrapolating the carbon rate to the carbon sequestered by all the 380 plant species identified in the current study,

5. WATER-USE EFFICIENCY

Manipur University gets paid supply of water from Public Health & Engineering Department (PHED), Government of Manipur to fulfill the water requirement of the campus for both academia and residential buildings. According to the data available with the Engineering Section of the University, daily water intake is 2.95 lakh liters. The University has an adequate installed capacity of the infrastructure facilities like underground water sumps and polycan storage. This water supply to the University is channelized by the Canchipur Water-Treatment Plant (CWTP) of the PHED, installed within the premises of the University. The CWTP treats the water collected from the pond 'Haomacha Pukhri' before supplying it to the University (Figure 3). Manipur University facilitates a pumping station, which maintains two reservoirs; one ground reservoir with a capacity of 4.5 lakh liters and another service reservoir at the hilltop with a capacity of 2.0 lakh liters.

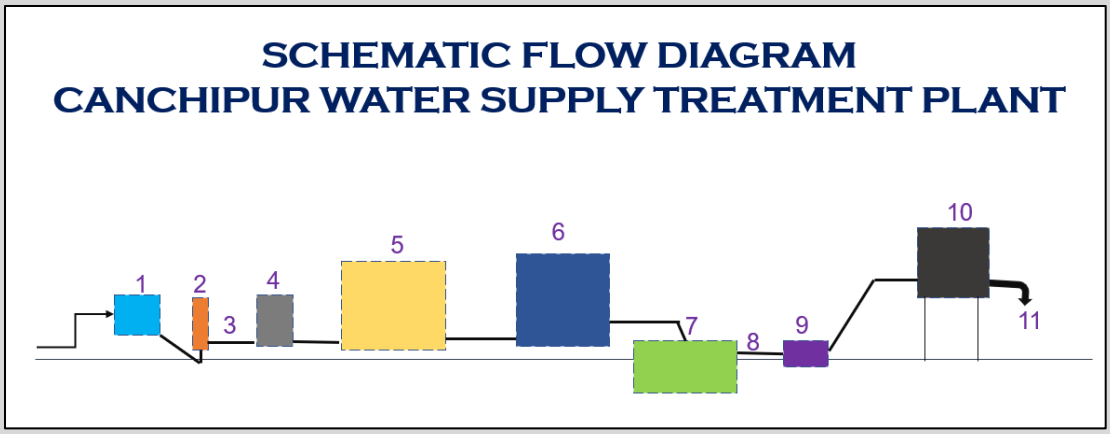


Figure 3: A schematic flow diagram of Canchipur Water-Treatment Plant (as shown on a board) informing the water treatment procedure steps; From Source (Haomacha pond) - 1. Infair – 2. Aerator – 3. Chemical mixing – 4. Flash mixer – 5. Clarifocculator – 6. Filter House – 7. Disinfection – 8. Ground Sump – 9. Pump – 10. Elevated Reservoir – 11. Distribution (Main).

Photograph Plate 7: a. the water-supply-system to the Washrooms and the departments installed with polycan; and b. the drinking water facility installed in the department.

Keeping the above water sources in confidence, the University provides an average volume of about 105 L of water per person to satisfy the daily requirement. The data collected from the academic departments and other centers indicated the daily consumption of *ca.*10 L of water per person, while the people residing in the University quarters and hostels are supplied with *ca.* 350 L of water per quarter daily, and that comes about 70 L of water/person/day. The remaining water is perhaps supplied to the administrative blocks, hospitals, and other construction sites.

6. ENERGY EFFICIENCY

6.1 Power Supply

The University is supplied with 1000 kW of electric power by Manipur State Power Distribution Company Limited (MSPDCL). According to the data provided by the university engineering section, 650 kW of electricity is supplied to the residential quarters and hostels. Academic departments are provided 125 kW, while the administrative block requires 50 kW of electricity (Table 4). The University has installed capacity of 10 kW of a solar power-based source of electricity as well.

Table 4: Distribution pattern of the power supply inside the MU campus

Sl. No.	Particulars	Capacity (kW)
1	Administrative Block	50
2	Academic Departments	125
3	Hostels	250
4	Bank & Post office	50
5	Residential Quarters	400
6	Health Centre	25
7	Water Supply	40
8	Street Lights etc.	60
9	Solar-Power based power installation	10
	Total	1010

Photograph Plate 8: Heavy Duty Electric Transformer for power supply and LED-based street lights to use during night installed in the Manipur University

6.2 Energy- Efficient Initiative

Manipur University has taken the following initiatives to encourage the use of renewable energy and to use electric power more efficiently-

1. A solar panel system with an installed capacity of 10 kW has been installed in the university guest house to supplement the uninterrupted power supply.
2. Solar-power-based street lights have also been installed in the front of every academic departmental building.
3. Instead of Non-LED bulbs, **LED bulbs** are used, and they represent more than 62% of lightening equipment installed inside the rooms of the University, along with conventional fluorescence tube lights.
4. Computation of the data revealed that the University has one air-condition for every 40 individuals and one electric fan for every three campus individuals. The number of such electric accessories appears to be significantly low due to the prevailing conducive salubrious climate within the university area.

Photograph Plate 9: a. & b. Solar Panels installed at the Guest House of the University; c. & d. Solar panel-based street light poles installed in the front of Departmental Buildings.

7. TRANSPORTATION

The University employees and students residing in and outside the campus prefer both private and public modes of transportation. The University facilitates bus service for routine commuting of the students. Based on the data submitted by all the Departments and Centers of the University, it is found that among the individuals using private vehicles, the majority prefers fossil-fuel (petrol or diesel) based vehicles. However, the recent estimate highlights that at least 10% of the university siblings have inclined towards non-fossil fuel-based vehicles like electronic bikes and bicycles. It is heartening to mention here that University maintains 55 bicycles for the intra-departmental movement of students. Figure 4 depicts the percentage of people and their mode of vehicle use.

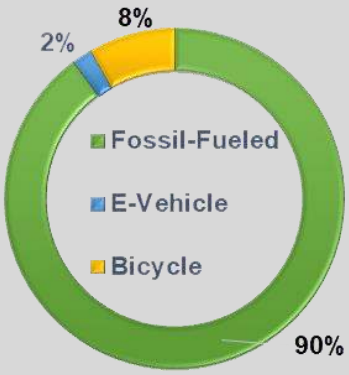
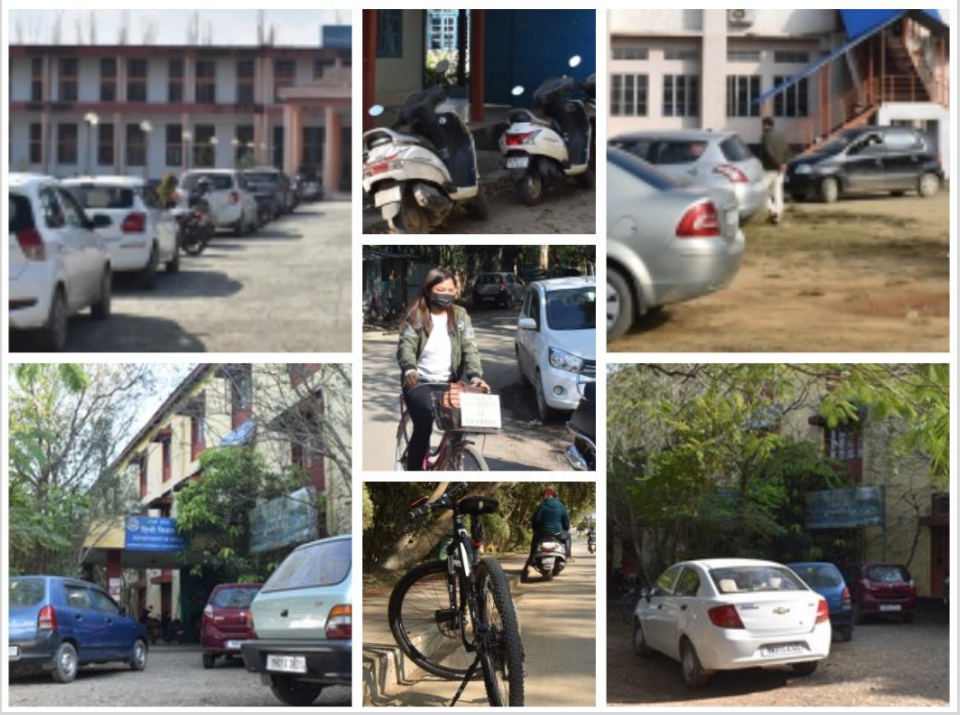


Figure 4: Type of vehicles used by the University siblings.

Photograph Plate 10: Various mode of transport vehicles used in the Manipur University campus



8. ENVIRONMENTAL QUALITY

8.1 WATER QUALITY

The University receives the water from the pond and river after treatment by the CWTP of PHED. Subsequently, the water is stored in our reservoirs. Therefore, the Department of Forestry and Environmental Science, MU, routinely tests the water quality [supplied within the campus to various buildings and residential quarters] as part of their studies. The water pH, dissolved oxygen (DO), biological oxygen demand (BOD), and total dissolved solids (TDS) of the water are checked periodically, and the data reflected that the above parameters are within the permissible limit as per the Central Pollution Control Board (CPCB), New Delhi (Table 5). Total Coliform count and turbidity of the water have been found marginally higher than the permissible limit; hence the water-treatment status is checked periodically and RO-based drinking water purifier is installed in all the blocks.

Table 5: Water quality inside the University campus confirmed by various standard parameters

Parameters	Sample sources				CPCB Permissible limit
	Drinking-Water		Non-Drinking Water	Water Bodies	
	Treated	Untreated			
Total Coliform (Count/100 mL)	12	26	26	33	0
pH	8.5	7.6	8.3	8.8	6.5-8.5 /6-9
DO (mg/L)	4.1	3.4	3.4	6.1	≤6
TDS (mg/L)	82	85	82	120	≤500
Turbidity (NTU)	19.5	20.4	21.3	28	≤10
BOD (mg/L)	1.16	2.9	3.8	4.32	≤5 for drinking and ≤30 for non-drinking water

8.2 AIR QUALITY

The concentration of particulate matter depicting air quality at various locations in the University was also assessed by the Department of Forestry and Environmental Science (Table 6).

Table 6: Air quality parameters at different sites of the Manipur University (Source: Dept of FES)

Sl. No.	Parameters	Sampling Site	Concentration ($\mu g/m^3$)	Permissible Limits (WHO) (For 24 Hours)
1.	$PM_{2.5}$	Department of Physical Education & Sports Sc.	155.34	25 $\mu g/m^3$
		Auditorium	58.33	
		State Bank of India	32.56	
		Heivok Boys Hostel	24.91	
		Manipuri Department	8.33	
		Quarter (Type V)	11.27	
		Average	**48.45**	
2.	PM_{10}	Department of Physical Education & Sports Sc.	100	50 $\mu g/m^3$
		Auditorium	269.88	
		State Bank of India	95.96	
		Heivok Boys Hostel	34.46	
		Manipuri Department	16.54	
		Quarter (Type V)	41.67	
		Average	**93.08**	

Manipur State Pollution Control Board (MSPCB) has installed a monitoring station inside the MU campus for air quality assessment, which records the data daily. It reflects on a digital board on the university entrance gate.

Photograph Plate 11: Showing the air quality parameter readings on the digital boards installed by MSPCB on the entrance gate of the Manipur University.

8.3 NOISE QUALITY

Noise refers to sounds that occur in our immediate vicinity but are not part of the environment under study. It is another sort of pollution that impacts our health and well-being. The Department of Forestry and Environmental Science took noise measurements at ten different locations on campus. The desired noise pollution for educational institutions and hospitals throughout the day is 50 decibels (dB), according to an Indian regulation established by the CPCB. The preliminary findings suggest higher noise levels at several locations on campus, but acceptable noise levels at the ladies' hostel No. 4, the Central Library, and the residential quarters (Table 7).

Table 7: Noise level (mean values) detected at the different locations of the Manipur University campus (Source: Dept. of FES)

Sl. No.	Location	Noise Level (In dB)	CPCB permissible level
1	MU Main Gate	73.24	50 dB (day) and
2	Traffic Square Point	64.85	40 dB (night) for
3	Ladies Hostel No.4	45.64	silent zones as
4	Residential Quarters	47.28	per Noise
5	SBI	73	Pollution
6	Administration Block	63.28	(Regulation &
7	Centenary Hall	59.50	Control Rules,
8	Boys Hostel No. 2	52.229	2000)
9	Central Library	48.39	
10	Dept. of Forestry & Env. Science	52.89	

9. WASTE MANAGEMENT

Manipur University generates wastes from the academic departments, offices, laboratories, lavatories, hostels, guest houses, and residential quarters (Table 8). The University has been taking service of a non-government organization Centre for Research on Environmental Development (CRED), Imphal, to collect wastes from the campus.

Table 8: Quantity of the wastes daily generated from different departments of the University

Sl. No.	Type of Wastes	Description	Generation / Day
1	Solid Wastes	Paper Waste	22.26 kg
		Wooden-Waste	103.02 kg
		Solid wastes	67.65 kg
		Construction related wastes	2.03 kg
2	Liquid Waste	Water Waste	5285 L
		Other Fluid wastes	15.60 L
3	Bio-medical Waste	Syringes, Inj. vials	1.5 kg
4	Bio-hazardous wastes		4.06 kg
5	Electronic Wastes		1.52 kg
6	Bio-degradable waste		51.10 kg

9.1 SOLID WASTE MANAGEMENT

The Manipur University collects daily solid wastes of approximately 195 kg. The solid wastes are collected in the dustbins (70 kg volume each) of three different colors of Red, Blue, and Green for non-recyclable, degradable/compostable, and recyclable wastes consequently. These solid waste collection dustbins have been placed in all departments, canteens, building entrances and exits, and along roadsides. The solid wastes separately collected through these dustbins are collected by CRED twice a week. Single-use plastic is officially banned inside the campus. CRED deposits the wastes at the Solid Waste Management Plant, Lamdeng, Imphal West.

9.2 LIQUID WASTE MANAGEMENT

The University faces a daily loss of 5285 liters of water during distribution through a few leakages and overflow. These leakages are routinely monitored and repaired by the civil division of the Engineering section. Sixteen liters of other liquid wastes come from the lavatories of departments and the residential quarters. All the building blocks exhibit sewage tanks and drainage systems for liquid waste, which need to be connected for channelized management.

Photograph Plate 12: Dustbins installed at different locations in the Manipur University campus for collection of solid-wastes.

Photograph Plate 13: Management of Biohazardous waste in Dept of Biochemistry

9.3 BIOMEDICAL WASTE MANAGEMENT

The University's health center generates a minimal number of biomedical wastes daily. Syringes and needles are destroyed in an electrical mechanical destroyer. Cotton swabs and their products are collected by the Biomedical Waste collecting Van. The University is negotiating with the Regional Institute of Medical Sciences (RIMS), and other Hospitals in Imphal, for biomedical waste management.

9.4 E-WASTE MANAGEMENT

The electronic material wastes are collected separately and later taken by the CRED.

9.5 WASTE RECYCLING SYSTEM

The University is establishing two composting units in the Department of Zoology and Forestry and Environmental Science to utilize the green wastes generated in plants litter inside the campus.

9.6 HAZARDOUS CHEMICAL WASTE MANAGEMENT

The University receives approximately 5 kg/day bio-hazardous wastes of chemicals from the Department of Biotechnology, Chemistry, and Biochemistry laboratories. These wastes come from culture media and plasticware utilized for cell culture. In the department of biotechnology, such bio-hazardous wastes are kept in 10% hypo-chloride solution for 12 hours before discarding. The GAC recommends the University authority to follow up hazardous chemical management in tune with Manipur State Pollution Control Board guidelines.

10. GREEN INITIATIVES

The administration of Manipur University introduces some green initiatives to maintain the green and clean environment inside the campus. A few of the significant initiatives are given below-

A. Go Green

Manipur University provides a bicycle facility on a daily-rent basis for the students and other visitors of the campus through the 'Go Green' initiative. This initiative is promoted routinely by the administration to encourage bicycles inside the campus.

Photograph Plate 14: Promotion of the use of bicycles through 'Go Green' and 'Fit India Movement' initiatives in the University campus.

B. Plastic Ban

Plastic carry bags, single-use plastics, thermocol, plastic bottles, and trays are entirely banned from being used inside the campus by the administration through its office order No. MU/6/14/2021/Admin/ 297 dated 7th September 2021.

C. LED Replacement

Non-LED bulbs are not used in the University and have been replaced with LED bulbs for more efficient power utilization. More than 60% of lightening accessories are based on LED only on the campus.

D. Cleanliness Drive

Cleanliness drives are carried out by all the departments and centers of the University to maintain proper hygiene and sanitization in the departments and campus.

E. Tree Plantation Program

On various occasions like World Forestry Day, World Environment Day, Earth Day, and Van-Mahotsav, tree plantation programs are organized by all the departments and centers.

Photograph Plate 15: Cleanliness drive organized by the Department of Biochemistry and Yoga

Photograph Plate 16: Tree plantation drive organized by Manipur Institute of Management Studies, and Department of Life Science (Zoology)

Photograph Plate 17: Cleanliness and tree plantation drive carried out by the Department of Forestry and Environmental Science students.

F. Speed Limit and No Horn Zone

The University has notified the speed limit of 30 km/h for the vehicles inside the campus.

The campus is declared a no-horn zone to limit noise pollution.

Photograph Plate 18: A board installed inside the Manipur University campus warning the speed limit and no-horn zone. Similar boards have been installed at several places.

11. CONCLUSION AND RECOMMENDATION

Manipur University is situated at the extreme east of India (24.82055ºN – 93.90285ºE) at an altitude of 786 m above mean sea level. Spread over 287 acres, the University campus has rich flora and fauna, a central water canal, water bodies, and a hillock. Over the period, the University has undertaken several green initiatives like afforestation program, green awareness camps, drawing competition, debate on environmental issues, seminars and symposia concerned with climate change, routine assessment of air and water quality, maintaining lawns and children parks, adopting different strategies to dispose accumulated wastes, vermicomposting and organic cultivation of vegetables within the campus, encouraging social work activities extended by different sections of the campus dwellers, promoting solar based sources of light and LED bulbs and bicycles for internal mobility.

Although several initiatives have been implemented and streamlined within the campus, the following recommendations by the green audit committee would undoubtedly provide an impetus for further growth and development in a sustainable manner. Under the infrastructural development, green building technology may be adopted wherever feasible. Installing solar panels at the rooftop of the buildings and vehicle parking sheds, recycling and composting the wastes to augment energy and manure, installing more units of rainwater harvesting system, encouraging the use of e-vehicles, expanding the campus green cover and regulating the water distribution etc., would pave the way further to achieve self-sufficiency to some extent, especially in harnessing energy and water resource for the campus.

12. ACKNOWLEDGEMENT

The Green Audit Committee appreciates the contributions of Manipur University's Heads of Departments and Directors of Institutes and Centers. They responded by filling out the questionnaire to the convenor. Moreover, special efforts have been made by faculties, scholars, and students from various departments and staff from the Engineering Section of Manipur University. The GAC gratefully acknowledge the extraordinary efforts of the following contributors-

A:	*School of Humanities*	*Prof N Aruna Devi, Dean*
1	Dance and Music	Dr P Lilabati Devi, Head i/c
2	English & Cultural Studies	Dr. I Gambhir Singh, Head
3	Fine Arts	Prof N Aruna Devi, Head i/c Ms. Moirangthem Monali, Asst. Prof.
4	Foreign Languages	Prof S Imoba Singh, Head i/c
5	Hindi	Prof Yashwant Singh, Head
6	Linguistics	Prof N Pramodini Devi, Head
7	Manipuri	Prof Toijam Tampha Devi, Head
8	Philosophy	Dr L Bishwanath Sharma, Head
B:	*School of Human & Environmental Sciences*	*Prof Soibam Ibotombi, Dean*
1	Anthropology	Prof M Manibabu Singh, Head
2	Earth Sciences	Prof Maibam Bidyananda Singh, Head Dr. Kh. Radhapiyari Devi, Guest Faculty
3	Forestry and Environmental Science	Dr Kh Raju Singh, Head i/c Dr. Gurumayum Ranibala, Guest Faculty Dr. Salam Dilip, Guest Faculty Ms. Bindiya Aribam, Ph.D. Scholar Ms. Kripalya Kangabam, Ph.D. Scholar Mr. Samananda Keisam, Ph.D. Scholar Mr. Suraj Nongthonbam, Ph.D. Scholar Ms. Kh. Hriiziirou Monalisa, Ph.D. Scholar Mr. Pirs Y. Lunghar, M. Sc. Student Mr. P. R. Shimray, M. Sc. Student Mr. Ano Rio, M. Sc. Student
4	Geography	Prof Kh Pradipkumar Singh, Head Dr. Avijit Mistri, Asst. Prof. Dr. Sananda Kundu, Asst. Prof. Ms. Ksh. Zeba Devi, Ph. D. Scholar Mr. K. Sanathoi Singh, Ph. D. Scholar Mr. Lanminthang Doungel, Ph. D. Scholar
5	Psychology	Prof M C Arunkumar, Head i/c Dr. Jitendra K. Kushwaha, Asst. Prof.
C:	*School of Life Sciences*	*Prof L Rupachandra Singh, Dean*
1	Biochemistry	Prof S Kunjeshwori Devi, Head (All the faculties equally contributed)
2	Biotechnology	Prof Lisam Shanjukumar Singh, Head

3	Life Sciences (Botany)	Prof M. Damayanti Devi, Head Prof. L. B. Singha
4	Life Sciences (Zoology)	Prof N Mohilal Meitei, Head Dr. Kh. Birla, Assoc. Prof.
D:	*School of Mathematical & Physical Sciences*	*Prof K Yugindro Singh, Dean*
1	Chemistry	Prof Okram Mukherjee Singh, Head Dr. Keisham Surjit Singh, Assoc. Prof.
2	Computer Science	Dr Haobam Mamata Devi, Head
3	Mathematics	Prof M Ranjit Singh, Head
4	Physics	Prof H Basantakumar Sharma, Head
5	Statistics	Prof Kh Kumarchand Singh, Head
E:	*School of Social Sciences*	*Prof S Mangi Singh, Dean*
1	Commerce	Prof Kh Tomba Singh, Head
2	Economics	Prof Ksh Jhaljit Singh, Head
3	History	Prof H Sudhirkumar Singh, Head
4	Law	Dr Yumnam Premananda Singh, Head Dr. Sapam Dilipkumar Singh, Asst. Prof. Yumnam Sadananda,
5	Library & Information Science	Dr Ch Ibohal Singh, Head
6	Mass Communication	Dr Ganesh Sethi, Head
7	National Security Studies	Prof S Mangi Singh, Head i/c Dr. Sarvasureshtha Dhammi, Asst. Prof.
8	Political Science	Prof Rajen Singh Laishram, Head
9	Sociology	Prof Kshetri Rajendra Singh, Head
10	South East Asian Studies	Prof H Sudhirkumar Singh, Head i/c
11	Manipur Institute of Management Studies	Prof L Jibon Kumar Sharma, Director
F:	*School of Engineering* Manipur Institute of Technology	*Prof R K Hemakumar Singh, Dean* *Prof N Basanta Singh (Principal i/c)*
1	Basic Sciences & Humanities	Dr Anita Sorokhaibam, Head i/c
2	Civil Engineering	Dr Y Arunkumar Singh, Head
3	Computer Science & Engineering	T Sonamani Singh, Head i/c
4	Electrical Engineering	Prof N Basanta Singh, Head i/c
5	Electronics & Communication Engineering	A Balarampyari Devi, Head i/c
6	Mechanical Engineering	Prof N Basanta Singh, Head i/c
G:	*School of Education*	*Prof. T Inaobi Singh, Dean*
1	Adult Continuing Education & Extension	Dr Chanam Sonia Devi, Head i/c
2	Education	Dr Premlata Maisnam, Head
3	Physical Education & Sports Science	Prof T Inaobi Singh, Head
4	Teacher Education	Prof T Inaobi Singh, Head i/c Dr. Soram Sonia Devi, Asst. Prof. Dr. Naziya Hasan, Asst. Prof. Mr. Akashchand Haobam (B. Ed. Student)
5	Yoga Science	Dr M Nodiyachand Singh, Head i/c Dr. Kuntal Ghosh, Asst. Prof.
H:	*Directors of the Centres/Community College/Cell*	
1	Centre for Entrepreneurship and Skill	Prof Ch Ibohal Meitei

	Development	
2	Centre for Human Rights & Duties Education	Prof Th Purnima Devi, Director i/c
3	Centre for Myanmar Studies (CMS)	Prof M C Arunkumar
4	Center for Study of Social Exclusion and Inclusive Policy (CSSEIP)	Prof E Bijoykumar Singh
5	Community College	Prof L Prabhakar
6	Centre for Women Studies (CWC)	Prof N Pramodini Devi
7	EMMRC (Educational Multimedia Research Centre)	Prof Kananbala Sarangthem, Director i/c
I.	*Hostels*	*Hostel Wardens*
1	Men's Hostel -1	Dr. S.Somokanta Singh
2	Men's Hostel -2	Dr. M. Thoiba Singh
3	Men's Hostel -3	Dr. M.Irikhomba Singh Mr. Mani (Care Taker)
4	Men's Hostel -4	Dr.Th. Rupachandra
5	Men's Hostel -5	Dr.Kh.Surachand Singh
6	Men's Hostel -6	Dr. W. Sobhachandra
7	Ladies Hostel-1	Smt. P. Jamini Devi
8	Ladies Hostel -2	Smt. P. Jamini Devi
9	Ladies Hostel -3	Dr. P. Lilabati Devi
10	Ladies Hostel -4	Dr.M. Premlata Devi
11	Ladies Hostel -5	Dr. Ruolkhuzo (RK)
12	Ladies Hostel -6	Dr. A. Radhamanbi
13	Ladies Hostel -7	Dr. Y. Rameshwori Devi
14	Ladies Hostel -8	Dr. K. Sobita Devi
15	Ladies Hostel -9	Dr. Khumtiya Debbarma
J.	*Health Center*	Physician In-Charge
K.	*Engineering Section*	*Mr. N. Thoiba Singh, UE*
L.	*Central Library*	*Dr, Nihar Kanta Patra, Librarian* *Mr. M. Lokendro Singh, Asst. Librarian*
M.	*Central Museum*	*Dr. M. Ramakrishna, Curator(i/c)* *Ms. R. K. Bidyabati Chanu*
N.	*Post Office*	*Branch Manager*
O.	*State Bank of India*	*Branch Manager*

ANNEXURE 1

MANIPUR UNIVERSITY
CANCHIPUR : IMPHAL

OFFICE ORDER NO. / 733
Dated, the 30th November, 2021

No.MU/GAC/NAAC/2021: The Vice-Chancellor is pleased to constitute a Green Audit Committee of the University consisting of the following members:-

1. Prof. R. Varatharajan - Chairman
   Department of Life Sciences (Zoology), MU

External Members

1. Dr. R.K. Nimai Singh, IAS (Retd.), Palace Compound, Imphal
2. Shri L. Joykumar Singh, IFS, Chief Conservator of Forest
   Department of Forest, Govt. of Manipur
3. Prof. L. Nabachandra Singh, Department of Agronomy
   Central Agricultural University
2. Dr. H. Birkumar Singh, Sr. Principal Scientist & Professor of CSIR
   North East Institute of Science & Technology, Lamphelpat, Imphal

Internal Members

1. Head, Department of Botany, MU
2. Head, Department of Zoology, MU
3. Head, Department of Forestry & Environmental Sciences, MU
4. Head, Department of Chemistry, MU
5. Head, Department of Earth Sciences, MU
6. Head, Department of Geography, MU
7. Head, Department of Economics, MU
8. Head, Department of Biochemistry, MU
9. Head, Department of Civil Engineering, MIT
10. Registrar, MU or his nominee
11. Finance Officer, MU or his nominee,
12. Controller of Examinations, MU or his nominee
13. Director, IQAC, MU or his/her nominee
14. University Engineer, MU
15. Medical Officer, MU
16. Dr. Vivek Vaishnav, Assistant Professor - Convenor
    Department of Forestry & Environmental Science

The term of the Committee shall be 1(one) year w.e.f. 30.11.2021.

(Prof. W. Chandbabu Singh)
Registrar