GREEN AUDIT REPORT

2020

Jawaharlal Nehru College, Boko, ASSAM

INTERNAL QUALITY ASSURANCE CELL (IQAC)

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INTRODUCTION

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. Green audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. It provides awareness to staff and students about green impact on campus. It could be stated that institutional self enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent. The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the pollution free green campus for the college which will lead for sustainable development and at the same time reduce a sizable amount of green house gases from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

OBJECTIVES:

In recent time, the Green Audit of an college has been becoming a paramount important for self assessment of the college which reflects the role of the college in mitigating the present environmental problems. The college has been putting efforts to keep our environment clean since its inception. But the auditing of this non-scholastic effort of the college has not been documented. Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

1. To map the Geographical Location of the college
2. To document the floral and faunal diversity of the college.
3. To record the meteorological parameter of Boko where college is situated.
4. To estimate the Energy requirements of the college
5. To document the ambient environmental condition of air, water and noise of the College
6. To introduce and aware students to real concerns of environment and its sustainability

METHODOLOGY:

The purpose of the green audit of Jawaharlal Nehru College is to ensure that the college campus is in accordance with the Green Policy adopted by the college. The methodology include: physical inspection of the campus, observation and review of the documentation, measurements and recommendations.

ABOUT THE COLLEGE

The college has overcome four decades of its existence amidst many ups and downs. From the academic session 1986 the science stream of the college came into existence. The purpose was just to give an easy access to the poor meritorious students of the locality to continue their science education for a better career in this age of science and technology. At present the college has two streams both in science and arts in the undergraduate level. Jawaharlal Nehru College has an adequate academic and physical infrastructure catering to the 14 subjects in the 10+2 and Under Graduate Classes. The college has regular PG courses in 2 departments Assamese and Maths under Gauhati University.

VISION & MISSION VISION STATEMENT

OUR VISION

To set a hallmark in the field of education and to preserve, create and disseminate knowledge through teaching, learning, innovation and experimentation to mould responsible individuals for leading a society with a desire for progress and prosperity of the human race.

OUR MISSION

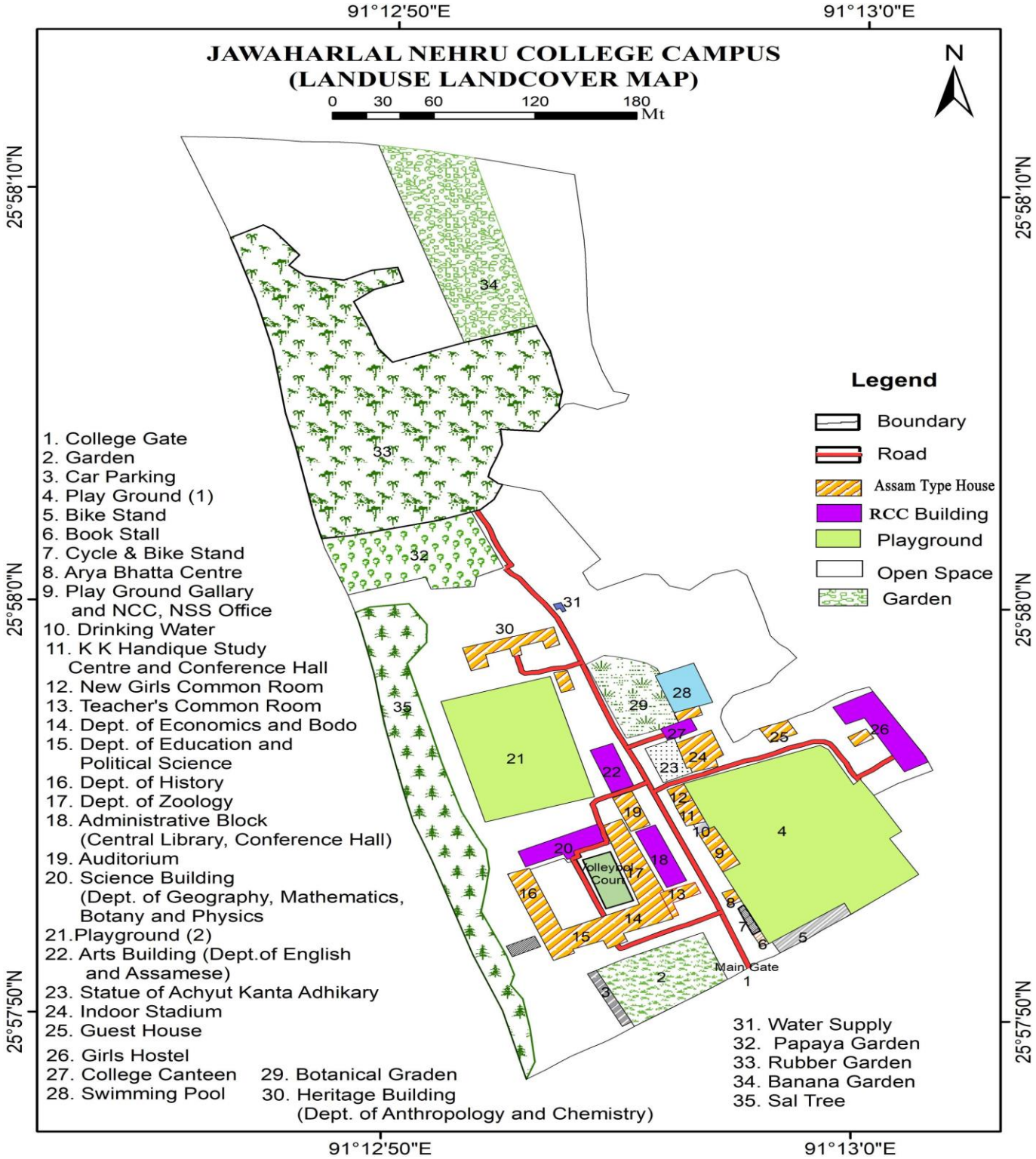
The following missions aim at translating the visions of the College into reality To create a healthy academic environment for promotion of quality education in the line of preservation, creation and dissemination of knowledge through teaching, learning, research and innovation. To build competitive modern infrastructure to attract students, teachers and researchers seeking to translate dreams into reality. To create an environment for all round development of human resources and to develop leadership quality. To set an ideal standard for achieving excellence in the field of teaching and research To document and preserve the rich ethnic, cultural and linguistic diversity of the region. To make higher education a part of the social environment through community participation and sustainable development to eliminate social evils that persists in the region and thereby creates social harmony

GREEN AUDITING

The college has adopted the ‘Green Campus’ system for environmental conservation and sustainability. There are main three pillars i.e. zero environmental foot print, positive impact on occupant health and performance and 100% graduates demonstrating environmental literacy. The goal is to reduce CO_2 emission, creating plastic free campus, energy use as well as to develop atmosphere where students can learn and be healthy.

OBSERVATIONS

GEOGRAPHICAL LOCATION WITH CAMPUS MAP IN SCALE



LAND USE (BUILT UP AREA(in Acres) ANALYSIS:

FID	Shape *	Id	Name	Area
0	Polygon	0	Open Space	1.765461
1	Polygon	0	Banana Garden	1.706813
2	Polygon	0	Open Space	3.20334
3	Polygon	0	Rubber Garden	5.685542
4	Polygon	0	Papaya Garden	1.037751
5	Polygon	0	Sal Tree	2.050522
6	Polygon	0	JNC Garden	0.717744
7	Polygon	0	Playground 1	2.895333
8	Polygon	0	Bookstall	0.013557
9	Polygon	0	Cycle and Bike stand	0.025766
10	Polygon	0	Bike stand	0.119717
11	Polygon	0	Aryabhatta Centre	0.019503
12	Polygon	0	Play ground Gallary,NCC,NSS	0.090532
13	Polygon	0	Drinking w ater	0.011791
14	Polygon	0	KKH Study Centre	0.049184
15	Polygon	0	New Girl's Common Room	0.035903
16	Polygon	0	Girl's Hostel	0.283443
17	Polygon	0	Warden House	0.026065
18	Polygon	0	guest House	0.051556
19	Polygon	0	Dept of Anthro & Chemestry	0.163014
20	Polygon	0	Water Supply Tank	0.006587
21	Polygon	0	New Boys Common Room	0.030743
22	Polygon	0	Botanical Garden	0.494667
23	Polygon	0	Sw imming Pool	0.18406
24	Polygon	0	Smimming pool house	0.027406
25	Polygon	0	Car Parking	0.068442
26	Polygon	0	Jnc Canteen	0.046499
27	Polygon	0	Flag	0.12438
28	Polygon	0	Indoor Stadium	0.136225
29	Polygon	0	Dept of Hist, Eco, Edu	0.739868
30	Polygon	0	Open Space	0.302513
31	Polygon	0	Open Space	0.26915
32	Polygon	0	Vollybol Court	0.167404
33	Polygon	0	Dept of english and Assamese	0.118655
34	Polygon	0	Auditorium	0.084354
35	Polygon	0	Administrative, Librabry	0.145027
36	Polygon	0	Playgrpund 2	1.560961
37	Polygon	0	Science Building	0.170836
38	Polygon	0	Teacher's Common Room	0.061666
39	Polygon	0	Old Cycle Stand	0.039093
40	Polygon	0	Open Space	20.796257

FINDINGS:

Jawaharlal Nehru College, which was established in the year 1986, has an eco-friendly environment. It has a long legacy of healthy environmental practices including periodic plantation, their preservation and maintenance. Its land use is such that about 45 % of the total area is occupied by open land and plantation that generates a better and sustainable campus environment.

TREE DIVERSITY OF JAWAHARLAL NEHRU COLLEGE, BOKO

Jawaharlal Nehru college is within the geo-position between latitude N and longitude E in Boko, Assam, India. It encompasses an area of about 120 bighas. The area is immensely diverse with a variety of tree species performing a variety of functions. Most of these tree species are planted in different periods of time through various plantation programmes organised by the authority and have become an integral part of the college. The trees of the college have increased the quality of life, not only the college fraternity but also the people around of the college in terms of contributing to our environment by providing oxygen, improving air quality, climate amelioration, conservation of water, preserving soil, and supporting wildlife, controlling climate by moderating the effects of the sun, rain and wind. Leaves absorb and filter the sun's radiant energy, keeping things cool in summer. Many animals are dependent on these trees mainly for food and shelter. Flowers and fruits are eaten by monkeys and nectar is a favourite of birds and many insects. Leaf – covered branches keep many animals, such as birds and squirrels. Different species display a seemingly endless variety of shapes, forms, texture and vibrant colours. Even individual trees vary their appearance throughout the course of the year as the seasons change. The strength, long lifespan and regal stature of trees give them a monument – like quality. They also remind us the glorious history of our institution. We often make an emotional connection with these trees and sometime become personally attached to the ones that we see every day. A thick belt of large shady trees in the surrounding of the college have found to be bringing down noise and cut down dust and storms. A recent study has revealed that the rich diversity of tree species have sequestrated a lots of organic carbon. Thus, the college has been playing a significant role in maintaining the environment of the entire Boko and its surrounding areas. The following are the tree species with whom we are being attached-

Sl no.	Name of plants	Family	Remarks
1	*Shorea robsuta*	*Dipterocarpaceae*	
2	*Hevea brazilensis*	*Euphorbiaceae*	
3	*Tectona grandis*	*Lamiaceae*	
4	*Mangifera indica*	*Anacardiaceae*	
5	*Polyrthia longifolia*	*Annonaceae*	
6	*Mimusops elengi*	*Sapotaceae*	
7	*Emblica officinalis(Phyllanthus Emblica*	*Phylanthaceae*	
8	*Eucalyptus*	*Myrtaceae*	
9	*Terminalia arjuna*	*Combretaceae*	
10	*Zizyphus jujuba*	*Rhamnaceae*	
11	*Terminalia chebula*	*Combretaceae*	
12	*Terminalia bellirica*	*Combretaceae*	
13	*Gmelina arborea*	*Lemiaceae*	
14	*Ficus benghalensis*	*Moraceae*	
15	*Azadirachta indica*	*Meliaceae*	
16	*Syzygium cumini*	*Myrtaceae*	
17	*Olea europaea*	*Oleaceae*	
18	*Lagerstroemia speciosa*	*Lythraceae*	
19	*Mesua ferrea*	*Calophyllaseae*	
20	*Neolamarckia cadamba*	*Rubiaceae*	
21	*Michelia champaca*	*Magnoliaceae*	
22	*Dalbergia sissoo*	*Fabaceae*	
23	*Calotropis gigantea*	*Epocynaceae*	
24	*Cryptomeria japonica*	*Cupressaceae*	
25	*Thuja sp*	*Cupressaceae*	
26	*Pine sp*	*Pinaceae*	
27	*Cycas sp*	*Cycadaceae*	
28	*Mirabilis sp*	*Nyctaginaceae*	
29	*Bougainvalleia sp*	*Bougainvalleiaceae*	
30	*Deodar cedar*	*Pinaceae*	

FAUNAL DIVERSITY IN JAWAHARLAL NEHRU COLLEGE CAMPUS

Jawaharlal Nehru college is located in Boko of South Kamrup district of Assam at the southern bank of river Brahmaputra, at the conjunction of Himalayan and Indo-Malayan Biodiversity hotspots. Jawaharlal Nehru College of Kamrup district falls in the Sub-Tropical climate region, and enjoys monsoon type of climate. The highest temperature is recorded just prior to the onset of monsoon (around May early June). Summer rain is heavy, and is principally caused from late June to August. The climatic condition of the Boko as a whole and Jawaharlal Nehru College in particular is very suitable for a wide variedly of flora and fauna to support its rich biodiversity. The faunal Diversity of Jawaharlal Nehru College campus has been studied and documented as below-

Faunal group	Scientific Name
MAMMALS	*Macaca mulatta*; *Sciurus carolinensis*; *Pteropus giganteus*
BIRDS	*Acridotheres tristis*; *Streptopelia orientalis*; *Athene noctua*; *Pycnonotus cafer*; Kingfishers, Parrot, Bota (Assamese), Egret
AMPHIBIANS	*Duttaphrynus melanostictus*, *Leptobrachium smithi*; *Fejervarya pierrei*; Hoplobatrachus *tigerinus*; *Hylarana tytleri*; *Humerana humeralis*; *Hylarana leptoglossa*; *Polypedates leucomystax.*
INSECTS	*Apis indica; Apis dorsata; Apis florae, Crocothemis erythraea; Pantala flavescens*
MOTHS & BUTTERFLIES	*Antheria assmensis; Bombyx mori; Philosamia ricini; Junonia atlites atlites ; Commander; Ethope himachala ; Melanitis leda leda ; Paltoporia paraka paraka; Ypthima baldus ; Acraea terpsicore ; Elymnias hypermnestra undularis ; Mycalesis perseus blasius ; Tanaecia lepidea lepidae ; Euploea core core*
SPIDERS	*Myrmachne orientalis ; Nephila plipes; Heteropoda sp;Phintella vitatta*

ELECTRICAL POWER CONSUMPTION AT JAWAHARLAL NEHRU COLLEGE

Jawaharlal Nehru College, being one of the largest colleges of Assam, consumes on an average 4700 KW hr (units) of electricity which turns out to be 56400 KW-hr per year only to maintain its volumetric activities throughout the year. The college authority is planning to install solar lights to decrease the power consumption. The contribution of LED bulbs and LED tubes to the net power consumption is 25 %. The authority keep on replacing the old filament bulbs, CFL bulbs and tube lights by low energy consuming LED bulbs and LED tubes and bulky high power consuming fans by energy efficient fans in order to keep the electricity consumption of the college as low as possible.

WATER ANALYSIS REPORT OF JAWAHARLAL NEHRU COLLEGE

Analysis Carried Out at Department of Botany, Jawaharlal Nehru College

Parameter	**Observable Value**
Clarity	Clear in appearance
pH	6.59
Temperature	27^0 C
Turbidity	1.85
Alkalinity	70 mg/L
DO	6.25 mg/L
Salinity	0.32 ppt
Conductivity	3.23 mS cm^{-1}
TDS	50 mg/L
TH	58 mg/L
As	-
Fe	0.47mg/L
F	1.57 mg/L
Na	182 ppm
K	4.7 ppm
Mg	22.95 mg/L
Ca	42.05 mg/L
NO_3^-	22.76 ppm
SO_4^-	6.59 mg/L
PO^4	0.51 mg/L
Cl	29.5 mg/L

*Water samples were collected from various point of college campus

AIR QUALITY IN BOKO: JAWAHARLAL NEHRU COLLEGE

The climate of Jawaharlal Nehru college campus located in Boko of South Assam is Sub-Tropical in nature and temperature varies from 14^0 C in January and 37^0 C in August. The average maximum temperature of the area varies from 18^0 C in the month of January to 34^0 C in the month of August. This indicates that, the coldest month during winter is January and warmest month during summer is August.

Air Quality determination
Satisfactory air quality index (OVERALL=88)
Date: 22/06/2019; Temp.: 37°C; clear sky

NO_2	2.64 ppb
NO	1.78 ppb
O_3	14.8 ppb
PM 2.5	14.6 $\mu g/m^3$
PM 10	25.3 $\mu g/m^3$
CO	201 ppb
SO_2	2.96 ppb
Wind Speed	4.21 m/s
Wind Direction	West North direction
Humidity	78.6%
Barometric Pressure	1002.89 hPa

NOISE LEVEL IN THE SURROUNDING OF JAWAHARLAL NEHRU COLLEGE

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound, (1) loudness and (2) frequency. Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-0 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB . The loudest sound a person can stand without much

discomfort is about 80 dB. Sounds beyond 80 dB can be safely regarded as Pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city. For international standards a noise level upto 65 dB is considered tolerate.

OBJECTIVES OF THE STUDY

The objectives of the study were as the following:

- To assess the impact on human work efficiency due to road traffic parameters, different noise indices, and attitudinal response.
- To study the temporal pattern of road traffic the study area.
- To study the existing status of noise levels in the study area by recording the noise intensity at various locations.
- Identification and consideration of suitable mitigation and abatement measures.

Noise level meter or noise measuring app, Noise Tube was used to measure the noise level. The noise level was recorded in and around the Jawaharlal Nehru College campus. At different selected sites of college, noise level had been measured. At each spot, the measurements were taken for 60 seconds during day time (7 AM- 5 PM) and noted down the measurements.

PLACE	**MEASUREMENTS (Duration in Sec.)**	**MINIMUM (dBA)**	**Maximum (dBA)**	**AVERAGE (dBA)**
College Gate	60	58.75	82.7	76.2
Canteen	60	24.6	63.9	53.3
Administrative Block	60	25.9	57.8	51.1
Library	60	3.17	21.35	16.38
Arts Block	60	51.7	66.8	64.3
Old Science Block	60	23.3	46.7	41.1
New Science Block	60	17.6	34.6	29.6
College Back Side	60	4.25	16.4	14.7
Girls Common Room	60	33.45	61.9	53.28

GREEN PRACTICE OR WASTE DISPOSAL OF JAWAHARLAL NEHRU COLLEGE

With smart initiatives like our Think Green Campus Model, Waste Management is helping colleges and universities achieve a higher level of environmental performance. By reusing or recycling we are: Contributing to the conservation of natural resources, saving energy, helping to protect the environment, Reducing landfill. We will also reduce our impact on the environment by minimizing the carbon emissions associated with both disposing of old products and obtaining new ones. Jawaharlal Nehru College adopts environment friendly practices and takes necessary actions such as – energy conservation, waste recycling etc.

The biological reusable waste generated are processed as organic manure for the plants available in the college campus and the other solid waste generated in the college campus is taken to the community bin for recycling and disposal.

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