

GREEN & ENVIRONMENT AUDIT REPORT

of

Krishna Kanta Handiqui State Open University

2020-2021



City Campus:

NH 37, Resham Nagar, Khanapara,
Near Bodoland Guest House,
Guwahati-781022

Main Campus

Headquarters: Patgaon, Rani.
Guwahati- 781017. Assam

Phone: +91 - 0361-2235971/2234964

Fax: 0361-2235398

Email: info@kkhsou.in

Website : www.kkhsou.in

Report prepared by

Aaranyak

A Scientific and Industrial Research Organization (SIRO), recognized by the Department of Scientific and Industrial Research (DSIR) of Ministry of Science and Technology, Government of India.

13, Tayab Ali Byelane
Bishnu Rabha Path, Beltola Tiniali
Guwahati- 781 028, Assam, India
Email: info@aaranyak.org

www.aaranyak.org

Audit Team

Adviser:

Dr. Bibhab Kumar Talukdar, Scientist G
Secretary General and CEO, Aaranyak

Coordinator:

Jayanta Kumar Pathak
Manager, Environment Education & Capacity Building Division, Aaranyak

Team members:

Dr. Jimmy Borah
Senior Manager, Legal & Advocacy Division, Aaranyak

Madhumita Borthakur
Spatial database Officer, Geo-spatial Technology and Application Division, Aaranyak

Avishek Sarkar
GIS Assistant, Geo-spatial Technology and Application Division, Aaranyak

Pranab Goswami
Organising Officer, Aaranyak

Acknowledgment

The Green and Environment Audit Assessment Team of Aaranyak would like to express its sincere sense of gratitude to Prof. Kandarpa Das, Vice Chancellor, Prof. Arupjyoti Choudhury, Registrar of KKHSOU, Dr. Ratul Kr. Patowary, Deputy Registrar (Administration), KKHSOU, Mr. Ranjib Baruah, a renowned architect and other associate staff of KKHSOU for their valuable support and cooperation extended to our team during the entire process of this audit.

Date: 1st March 2021

Declaration by Audit Agency

This Green and Environment Audit report is being prepared by Aatanyak, which is a registered society and a Scientific and Industrial Research organisation, recognised by the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology, Government of India.

This report is based on visit made to the university on 16th February 2021 to the city campus of K.K. Handiqui State Open University (KKHSOU), visit to Maincampus on 18th February 2021 and informations provided by the KKHSOU authorities without any manipulation. This report is being prepared by Aaranyak without any interference from the KKHSOU authorities and opinion/opinions expressed in this report are free from any influence of the authorities and Audit team prepared this report with honesty, keeping its independent characters intact.



*Bibhab Kumar Talukdar, PhD
Chief Executive Officer, Aaranyak
13 Tayab Ali Byelane
Bishnu Rabha Path
Beltola Tinali-Bhetapara Link Road
PO: Beltola, Guwahati 781 028
Assam, India
Email: ceo@aaranyak.org*

Table of Content:

	Page Number
Executive Summary	: 1
About the University	: 3
Purpose of this Audit	: 6
Key Findings during the Audit	: 7
Recommendations with Future Monitoring Benchmarks	: 13
Conclusions	: 15
Annexure-1	: 16
Annexure-2	: 17

EXECUTIVE SUMMARY

The shared responsibilities to take care for a clean and green environment lies with all citizens. Academic institutions, like Universities can play a leading role in shaping the mindset of students to act for promotion of clean and green environment. Most of the academic institutions also have vast campus areas which may be used to promote diverse ecological functions including conservation of water, facilitating increase oxygen production from tree plantation and conservation, use of renewable energy in the campus and an open learning hub from nature.

This Green and Environment Audit was done as per request received from competent authority of K.K. Handiqui State Open University. University authorities during the physical visit made by the team, briefed about various initiatives being undertaken by the University in past few years to promote their efforts for green and clean environment in the campus. The university authorities also revealed that the city campus of the university is under construction and not yet completed fully. As such this report didn't put emphasis on clean and green aspects of the city campus of the university as during the construction period, it is obvious that campus is likely to be dusty with residues of building materials due to massive construction work being in progress. However, the offices of the university in city campus along with room being used by faculties have been kept clean with small dustbins observed in every rooms to collect solid waste materials for disposal.

The main university campus has more open and green areas. The main campus has been contributing towards ground water recharge through their un-build areas including natural regeneration of vegetation cover. Both the campuses of the university has vast opportunity to start rain water harvesting from building roofs.

Further, Green and Environment Audit team to be engaged by the university authorities in future, may kindly compare the progress made by the university authorities based on the suggestion provided in this report to ascertain progressive steps taken by the university authorities. The main university campus being located in close proximity of the only Ramsar Site in Assam - the Deepar Beel, the university may explore some long-term research and outreach activities to keep this important wetland conserved for prosperity by planning cross cutting applied research in collaboration with other knowledge-based institutions and conservation organisations, that could strengthen conservation of the only Ramsar site in Assam.

ABOUT THE UNIVERSITY:

The Krishna Kanta Handiqui State Open University (KKHSOU), established under the provision of the KKHSOU, Act 2005 enacted by the Govt. of Assam & published in the Assam Gazette (extraordinary) dt. 29/9/05 has been recognized by the former Distance Education Council, New Delhi (now DEB, UGC) vide letter no. DEC/Misc/07/5957 dated 03/10/07. The University Grants Commission vide its letter No. F.9-13/2008(CPP-I) dated 18th March, 2009 also has empowered the University to award degrees under Section 22 of UGC Act, 1956.

VISION OF KKHSOU: In the spirit of reaching out to the unreached, KKHSOU endeavours to provide higher education and training in various skills using the latest educational inputs and technology.

COURSES OF KKHSOU: Currently KKHSOU offers Master Degree in 9 subjects, PG Diploma in 8 subjects, Bachelor Degree in 15 subjects, Diploma in 7 subjects, Certificate course in 8 subjects apart from Ph. D and M. Phil.

It is worth to mention that the University primarily targets to provide quality education, knowledge and training in various skills to the following groups of people.

1. Women learners especially housewives who want to get empowered with higher education and acquire professional skills.
2. Differently abled persons.
3. Persons who could not complete higher education in time during their student days.
4. People hailing from far flung remote areas and living in other disadvantageous conditions.
5. Employed/self-employed persons with penchant for higher education and learning skills.
6. Persons who couldn't get access to higher education in conventional system for various reasons.
7. Working people who wish to hone their professional skills.

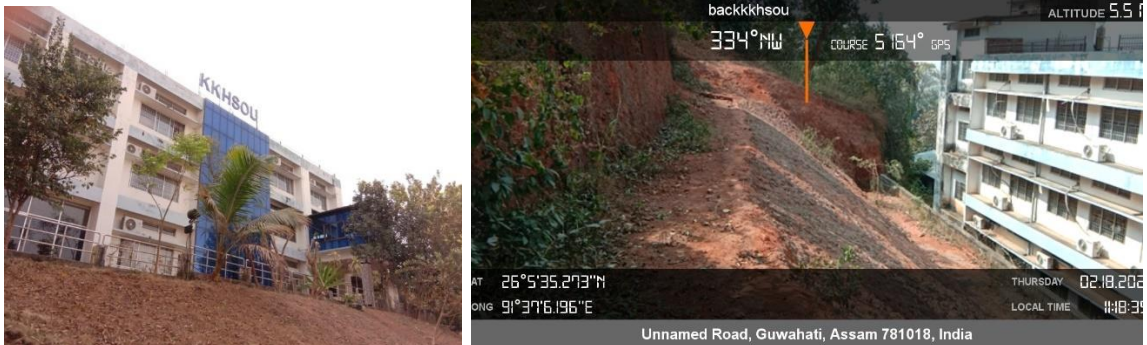
The KKHSOU has two main premises of its own.

A. Khanapara Campus or City Campus:



The Khanapara campus, which is the main campus of the KKHSOU, is located at Khanapara, Guwahati. Total area of this premise is 10 bigha (about 13378 m² in Assam). Construction activities are in progress in the campus during the time of reporting.

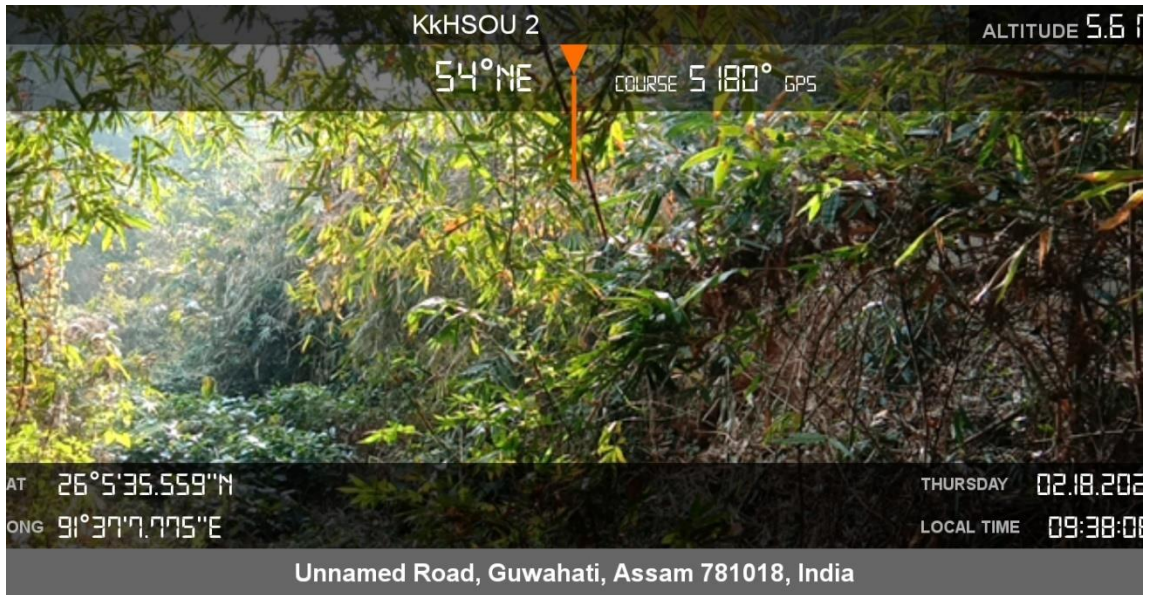
B. Rani Campus or Main Campus:



The Rani campus is located at Patgaon, under Dakhin Rani Mouza. Total area of this premise is 61 Bighas (about 81,605.80 m²). This plot of land was provided to KKHSOU by the Govt. of Assam in a phase manner in the year 2009 and 2010. It is worth mentioning that though Govt. of Assam gave permissions for utilization of the land area to KKHSOU, it has also clearly mentioned about the ecological role and responsibilities of KKHSOU authority. Govt. of Assam mentioned, while providing the government land to this university, Assam Government mentioned in the official letter that the **University Authority will have to strictly adhere**

to the provisions of the Assam Hill Land and Ecological Sites (Protection & Management) Act 2006.

Currently, the three storied building of KKHSOU Rani Campus built in an area of 265.82 sq meter and is being used to store publications of KKHSOU, since 1st January 2021, from the date of shifting the main office function to Khanapara. The rani campus of the university maintains natural vegetation in un-built areas.



The Institution plans to develop the Rani Campus as an 'extension center' in the near future.

PURPOSE OF THIS AUDIT:

The University Grant Commission (UGC) of India increasingly emphasizing the colleges and universities in the country to make needed efforts to maintain green and clean environment in the premises of these institutions. Academic institutions can play a leading role in inculcating in the minds of students with regards to take care for a green and clean environment and as such periodic green and environmental audit of academic institutions are very important to monitor the trend of changes that an academic institution have made over the years to promote green and clean environment in their respective campus.

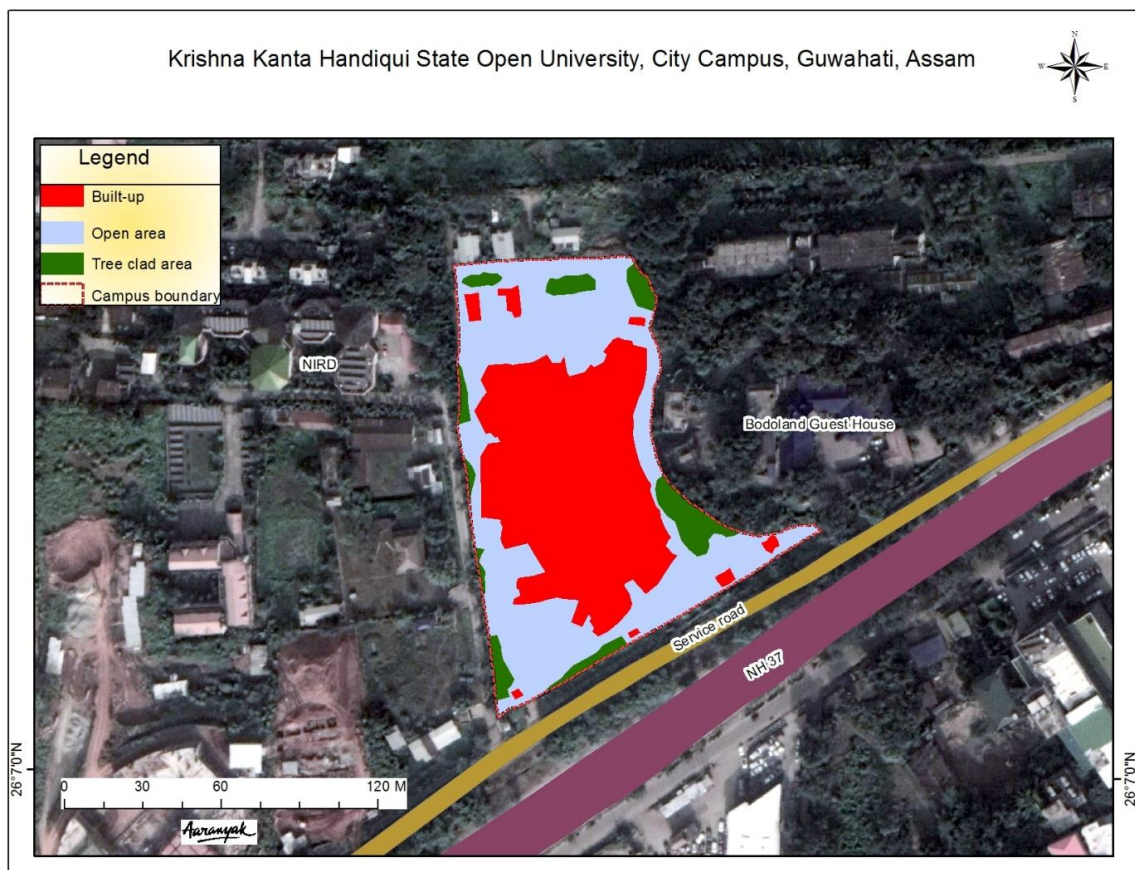
This Green and Environmental Audit was done as per request received from competent authority of KKHSOU to carry out the audit. Aaranyak, is a registered society, established in 1989 and have been working in the field of biodiversity research and environment protection in eastern Himalayas. Aaranyak is also a Scientific and Industrial Research Organisation (SIRO), recognized by the Department of Scientific and Industrial Research (DSIR), Ministry of Science and technology, Government of India since 2006.

In this green and environmental audit, we tried to collate the basic informations from the KKHSOU authorities for 2020-2021 which can act as baseline information to compare with the improvements made by the university authorities to further enhance their efforts for green and clean environment in their two campuses and most importantly among the minds of their students, faculties and support staffs.

KEY FINDINGS DURING THE AUDIT:

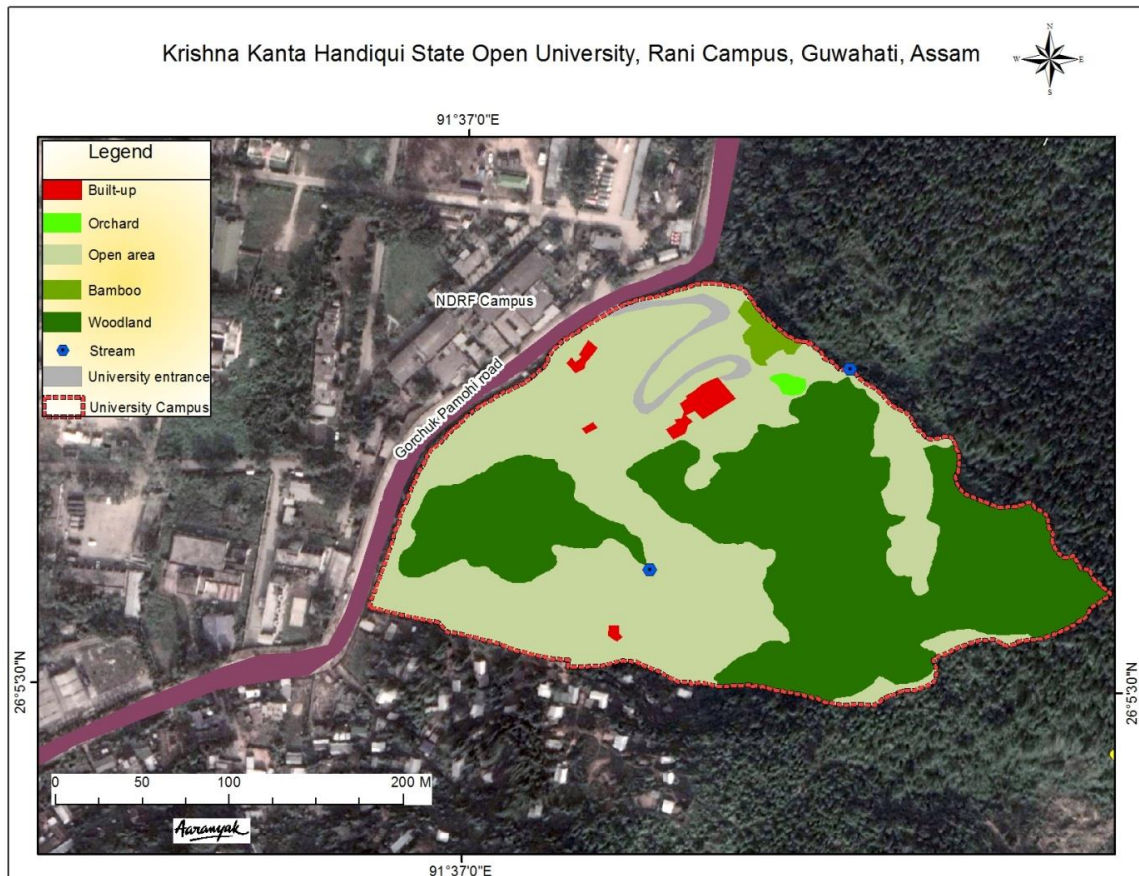
A. LAND USE LAND COVER

As mentioned, Krishna Kanta Handiqui State Open University has two campus locations, the City Campus (at Khanapara) and Rani Campus (near Deepor Beel Ramsar Site). The city campus of KKHSOU is under construction, located adjacent to NIRD, sharing its boundary with the NH-37. Most of the area is built up keeping in mind the long-term facilities to be needed for this university, with construction still under progress. Trees have been planted along the boundary of the campus. Less than one percent of the campus area is tree clad.



The KKHSOU main campus (also known as Rani campus) is located South-west of Deepor beel Ramsar site, which is also a Wildlife Sanctuary and North-west of Garbhanga Reserve Forest on the Gorchuk-Airport road. The campus has a total area of around 81,000 m². The land uses within the head office campus are: Built-up (Administrative building, Staff living area, Gurudwara, Power house and small houses), roads and a small plantation area of pineapple and orange. Only

about 1% of the total area is built-up, and the Administrative building covers the major part (about 265 m²), followed by the Gurudwara. The University road connects Administrative building with Gorchuk-Airport road. Land covers within the university campus are woodland (including a small patch of *Tectona grandis*), Bamboo patch, Stream (running parallel to each other on either side of the major built-up area) and an open area.



B. CAMPUS BIODIVERSITY / VEGETATION PATTERN

The vegetation type is similar to that of Garbhanga Reserve Forest. Behind the administrative building, a patch of moderately dense forest (MDF) (woodland) stretches till the southern boundary and across it. The campus has more than one-third (approximately 30,000 m²) of its area covered by MDF. A small patch of *Tectona grandis* is also present within the MDF area. The rest of MDF has a diverse tree population. A large part of the eastern boundary has a number of bamboo clumps (covering about 1,000 m²), and they run down along the boundary, both within and outside of it. Other than this particular area, a number of bamboo patches are located across the campus, mostly at the

transition zone from open area to MDF. The two streams run parallel to each other on either side of the university, from North East to North West. They are separated by the major built-up area of the campus. Invasive plants, the likes of *Lantana camara* and *Ageratum conizoides* were found to cover the open forest area of the campus. A high intensity of *A. conizoides* was found along both the streams. Other recurring shrubs in the open forest were *Bidens pilosa*, *Melastoma malabathricum*, *Clerodendrum indicum* and *Xanthium strumarium*. *The presence of a diverse population of butterflies and reptilian fauna indicates a healthy ecosystem.*

A list of flora and fauna recorded in the campus is being attached as Annex-1 and Annex-2 respectively:

C. DRINKING WATER AND WATER RESOURCE MANAGEMENT

- i. **Dependency on sources:** In both the campuses, KKHSOU is totally dependent on ground water. Deep bore well is the only water source to fulfill the daily water needs of the campus. The Khanapara campus has a total of 11,000 liters storages capacity while the Rani campus has 2000 liters storage capacity.

As Khanapara campus is under construction, KKHSOU is expecting around 1000 new students and staffs after completion of the construction which will result into the more need of potable water to be extracted from ground water in future. In the Rani Campus, two steps filtration cum purification practices (sand filter and aqua guard filter) is observed. Besides, the storage maintenance is done almost on regular basis.

Through physical observation, contamination as well as leakage of storage was not observed.

- ii. **Water consumption pattern:** The water is basically used for drinking, cooking, cleaning, gardening purpose. In both the campuses few office staff stay 24x7 in the premises for surveillance and upkeeping purposes.

iii. **Management of natural streams:**

We observed that there are two streams flowing through the main campus in Rani area. The stream water can be used for landscaping rather using the bore welled ground water.

It is appreciable that the KKHSOU has not blocked or diverted the flow of the streams. Couple of villages uses the stream water to fulfill their daily needs. Some people collect the water directly from the stream or even bath on the stream. Moreover, some villages located far from the KKHSOU campus, collect the stream water through pipe.

D. WASTE MANAGMENT PRACTICES

Though construction is going on in the Khanapara campus, segregation of solid waste is not observed in both the campuses. Currently in Rani campus, production of waste is quite minimum as only 5 staffs stay in the campus regularly.

But the good thing is that the management is planning to use 'earthen cup' instead of paper and plastic cups in the campus as stated by Hon'ble Vice Chancellor of the university when this audit team had a brief interaction with him at his office in city campus, Khanapara. The university is planning to adopt an effective waste management strategy once building construction is over in city campus as stated by the university authorities.

E. BEST PRACTICES:

Since 2016, KKHSOU has been trying to inculcate a sense of responsibility into the minds of the budding generation in protecting the natural environment by observing World Environment Day in the neighboring schools at Rani. Additionally, the authority is also trying to motivate and encourage its staff for the same by observing such days of environmental significance in the university campus too.



KKHSOU celebrated 'Swachh Bharat Pakhwada' in 2018. KKHSOU also carried out plantation activities both inside and outside its campus. Except clearing of a small portion of natural vegetation of about 200 m² area in Rani campus, the University preserved the natural environment as it is. The University restrained from cutting trees while building the road leading to the Rani campus. It reflects their respect and responsibilities towards nature.



The images reflect plantation drive by the university in their Rani campus and also celebrating World Environment Day as outreach activities



From our field visit to the two campuses of KKHSOU we have noticed some environment friendly innovative plan already initiated by the university. The KKHSOU has preserved the top soil of the built-up area of City campus in Khanapara, which will be used in plantation work to be carried out in the campus after completion of the construction as revealed by the university authorities.

1. The KKHSOU has a plan for use of renewable energy, *i.e.* solar power. They are planning to generate 300 KW in the city campus located at Khanapara. Initially, the university will try to achieve 10% of the targeted energy. They have already kept the provision of solar connection on electric panels.
2. In city campus, KKHSOU has constructed Bio-digestible Septic tank. The release water of the tank will be used in landscaping and other purposes.
3. To minimize the wastage of water, the University is planning to use auto stop device in taps.
4. To collect and preserve Rain Water, the University has already installed separate pipe and reservoir. They have also separate water line system for cisterns.
5. Terrace landscaping is designed outside and inside the building covering atrium area to get the natural ambience and fresh air. Roof top gardening is also in the plan of the university as revealed during the visit of this audit team.
6. Almost 70% of the total room of the buildings will have natural light ventilation facilities in Khanapara campus.
7. Use of photovoltaic panels to support energy supply to common area/ external area is also in the plan of the university.
8. In Rani Campus the KKHSOU may plan to set up medicinal plant garden in future.

RECOMMENDATIONS WITH FUTURE MONITORING BENCHMARKS:

The Audit team, based on the visit made and interactions with officials of the KKHSOU including Hon'ble Vice Chancellor of the university, realized the need for a future road map for the university so that university authorities can further enhance their efforts to opt for green and clean approach to show their care for environment and nature. Our recommendations are as follows -

- 1) KKHSOU may opt for a **periodic analysis of potable Water Quality in their two university campuses extracted from ground water reservoirs** to ascertain any precautionary steps needs to be taken to ensure the health of its officials and students. The University authority may follow the Indian Standard, IS 10500: 2012 Drinking Water Specification, for further details.
- 2) As people are using the stream water from the Rani campus of the university, it is advisable to **maintain the cleanliness of streams** regularly by the KKHSOU or by the local Community as shared responsibilities. The KKHSOU may built local capacity of user of water from the stream on water purification process. By such noble and social initiative, KKHSOU may also contribute to achieve the **Sustainable Development Goal 6** (Clean Water and Sanitation).
- 3) KKHSOU have huge opportunities to **adopt Rain Water Harvesting** effectively in its Khanapara Campus as built-up area is almost 75% of the total area. It is advisable to give emphasize on the use of Surface Water and Rain Water, in both the campuses of the university, wherever possible. At this stage since rain water harvesting has not been tapped, the university may opt for rain water harvesting from building roofs in phased manner which the future Green and Environmental Audit team may monitor to compare the progress being made by university authorities
- 4) **Plantation** (Native Evergreen trees/Fruit bearing plants) may be done successfully in the surroundings of Khanapara premises; at least 2-3 rows in the front side. It will directly help in reducing noise and give great relief from dust.

- 5) To strengthen outreach activities of the university, the authorities may think for some outreach activities related to Ecological/Natural Resource Management, through which the university could contribute towards documentation and conservation of rich biodiversity of the state.
- 6) KKHSOU may develop a GREEN and ENVIRONMENT POLICY for its own use.
- 7) The university may plan a road map for expansion of buildings in their two university campuses by keeping the option open to keep as much area possible as open area as natural as possible. During such construction, university authorities may look into which surface areas need to be concretized and which areas can be kept as natural as possible to maintain open area to facilitate ground water recharge along with natural growth of vegetation. Aesthetic values of the university campus need to be preserved as far as feasible while carrying out development activities to cater the needs of increasing number of students.
- 8) Renewable energy like solar energy may be a good alternative source of clean energy for KKHSOU which the university authorities may consider to use in phased manner based on the availability of fund and fund generation specifically for use of renewable energy like solar power.

Conclusions:

The Green and Environment Audit team feels that considering the fact that the university is an open university and so far, distant learning is being practiced, there is significant environmental consciousness among faculty members and support office staffs. The environmental awareness initiatives taken up so far may be further intensified by involving the zeal of the students to be properly guided by faculty members. The installation of solar panels and rain water harvesting system in phases manner by KKHSOU authorities may be looked as opportunities to shape the university as a green, clean and environmentally conscious university in the region. The KKHSOU has huge opportunities to use their open space in Rani Campus with proper scientific design to keep the landscape as environment friendly and natural as possible. The streams and other natural water sources in Rani campus may be cleaned periodically so that invasive plant species or other such aquatic species doesn't destroy the original characteristics of the stream and other natural water sources.

Few recommendations are added to curb the menace of waste management using eco-friendly means. This may lead to well-to-do future in context of Green University Campus & thus contributing towards sustainable environment and development. As part of green audit of campus, we carried out the environmental monitoring of campus including Illumination and Ventilation. It was observed that illumination and ventilation seems adequate.

Future Green and Environment Audit team may look into the recommendations provided in this report so that a comparative change scenario can be drawn in next 5-10 years on efforts the KKHSOU authorities have taken based on these recommendations.

Annexure-1:

Flora

SL. No.	Local Name	Common Name	Botanical Name
1	Acacia	Acacia	<i>Acacia auriculiformis</i>
2	Taruwa kodom	Sweet acacia	<i>Acacia farnesiana</i>
3			<i>Ageratum conizoides</i>
4			<i>Ageratum conizoides</i>
5	Satiyana	Indian Devil's tree	<i>Alstonia scholaris (L.) R. Br.</i>
6	Sumathira	Pineapple	<i>Ananas comosus (L.) Merr.</i>
7			<i>Araucaria heterophylla</i>
8	Konthal	Jack fruit	<i>Artocarpus heterophyllus Lam.</i>
9	Karobi	Star Fruit	<i>Averrhoa carambola L.</i>
10	Neem	Neem	<i>Azadirachta indica</i>
11	Banh	Bamboo	<i>Bambusa spp.</i>
12			<i>Bidens pilosa</i>
13	Poma		<i>Cedrela febrifuga</i>
14	Robab Tenga	Pomelo, Shaddock	<i>Citrus maxima</i>
15	Kamala	Orange	<i>Citrus reticulata Blanco</i>
16			<i>Clerodendrum indicum</i>
17	Narikal	Coconut	<i>Cocos nucifera</i>
18	Jolphai	Olive tree	<i>Elaeocarpus floribundus Bl.</i>
19			<i>Lantana camara</i>
20	Bel	Wood apple	<i>Limonia acidissima</i>
21	Aam	Mango	<i>Mangifera indica</i>
22	Malabor	Malabor	<i>Melastoma malabathricm</i>
23			<i>Melastoma malabathricum</i>
24	Bokul		<i>Mimusops elengi Roxb.</i>
25	Banana	Banana	<i>Musa acuminata</i>
26	Aamlokhi	Amla	<i>Phyllanthus emblica</i>
27	Madhui Aam	Guava	<i>Psidium guajava</i>
28	Makri shal		<i>Schima wallichii</i>
29			<i>Simarouba glauca</i>
30	Jaam, Jamun	Jamun	<i>Syzygium cumini (L.) Sheels</i>
31			<i>Tectona grandis</i>
32	Holokh		<i>Terminalia myriocarpa</i>
33			<i>Xanthium strumarium</i>

Annexure-2

Fauna

In our rapid assessment a total of five (05) mammalian species, five (05) reptiles, 11 birds and three (03) butterfly species recorded. We have not studied invertebrates, insects and other taxa in rapid assessment.

SL. no		Common Name	Scientific Name
1	Mammals	Assamese macaque	<i>Macaca assamensis</i>
2		Barking deer	<i>Muntiacus muntjak</i>
3		Mongoose	<i>Herpestes edwardsii</i>
4		Indian palm squirrel	<i>Funambulus palmarum</i>
5		Porcupine	<i>Hystrix indica</i>
1	Reptiles	Monitor spp.	<i>Varanus spp.</i>
2		Asian House Gecko	<i>Hemidactylus frenatus</i>
3		Monocled Cobra	<i>Naja kaouthia</i>
4		Red-necked Keelback	<i>Rhabdophis subminiatus</i>
5		Burmese Python	<i>Python molurus bivittatus</i>
1	Birds	Common tailorbird	<i>Orthotomus sutorius</i>
2		Common myna	<i>Acridotheres tristis</i>
3		Jungle myna	<i>Acridotheres fuscus</i>
4		Black-hooded Oriole	<i>Oriolus xanthornus</i>
5		Jungle Sparrow	<i>Passer pyrrhonotus</i>
6		Green Pigeon	<i>Treron phoenicoptera</i>
7		Red-vented Bulbul	<i>Pycnonotus cafer</i>
8		Coppersmith barbet	<i>Psilopogon haemacephalus</i>
9		Asian Koel	<i>Eudynamys scolopaceus</i>
10		Spotted Dove	<i>Spilopelia chinensis</i>
11		Oriental magpie-robin	<i>Copsychus saularis</i>
1	Butterflies	Common Duffer	<i>Discophora sondaica zal</i> <i>Westwood, 1851</i>
2		Himalayan sailor	<i>Neptis mahendra Moore, 1872</i>
3		Common glider	<i>Neptis sappo</i>



Natural Vegetation being maintained at the KKHSOU Main Campus in Rani, Guwahati

