

GREEN AUDIT REPORT

2020-2021



KOLHAN UNIVERSITY, CHAIBASA

INTRODUCTION:

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of institute. It aims to analyze environmental practices within and outside of the concerned place, which will have an impact on the eco-friendly atmosphere. Green audit is a valuable means for a university to determine how and where they are using the most energy or water or other resources; the university can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that the university 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 Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO₂ 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 institution has been becoming a paramount important for self-assessment of the institution which reflects the role of the institution in mitigating the present environmental problems. The university has been putting efforts to keep our environment clean since its inception. 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:


Director IQAC
Kolhan University
Chaibasa


Registrar
Kolhan University
Chaibasa

- To map the Geographical Location of the university
- To document the floral and faunal diversity of the university
- To record the meteorological parameter of Chaibasa where Kolhan University is situated
- To document the ambient environmental condition of weather, air, water and noise of the university
- To document the waste disposal system
- To estimate the Energy requirements of the university
- To report the expenditure on green initiatives during the last five years

METHODOLOGY:

The purpose of the green audit of Kolhan University is to ensure that the practices followed in the campus are in accordance with the Green Policy of the country. The methodology includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

ABOUT THE UNIVERSITY:

Kolhan University was started as a state university on 13th August 2009 in the region dominated by various aboriginal tribes along with the Asia's densest Saranda Forest, and mineral & industry rich cities of Jharkhand. It has carved a niche for itself through its contribution in teaching, research and outreach programmes with 19 Constituent Colleges, one autonomous college, one medical college, two affiliated dental and nursing colleges, 12 affiliated B.Ed. Colleges and 16 affiliated colleges to it, the University has become a pioneer in designing need-based academic programs and is largely responsible for the growth and development of Kolhan Division of Jharkhand, through its catalytic role in empowering people. Kolhan University has facilitated with community empowerment through addressing its societal problems and providing the solution to it. The university has established a Tribal Museum for promoting tribal arts, culture, handicrafts, medicine & eco-friendly life style.

VISION & MISSION STATEMENT:

OUR VISION

Arsai
Director IQAC
Kolhan University
Chaibasa


Registrar
Kolhan University
Chaibasa

Realization of Glimpses of a Golden India in the real (rural) India which lives and abounds in its villages. Kolhan University will excel nationally and distinguish itself as a recognized pre-eminent leader to serve this 70% Brotherhood through its socioeconomic upliftment by exposure of the have-nots to science, social science, humanities and medical field thereby grooming them as technically competent and intellectually-vital graduates through practically focused quality learning experiences, and thus assuring productive careers for them.

OUR MISSION

- Upliftment of rural students through quality education.
- Respond to local societal needs by developing selected 'targeted research projects'.
- Quality training programs in need based modern technology.
- To maintain state-of-the-art infrastructure in laboratories.
- To promote culture of self-employment.
- To impart non-formal education to unemployed youth.
- To inculcate moral, ethical, spiritual values in education at all levels.

GREEN AUDITING:

Kolhan University has adopted the 'Green Campus' system for environmental conservation and sustainability. There are three main 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 CO₂ emission, energy and water use, while creating atmosphere where students can learn and be healthy.

LAND USE ANALYSIS, KOLHAN UNIVERSITY, CHAIBASA, JHARKHAND:

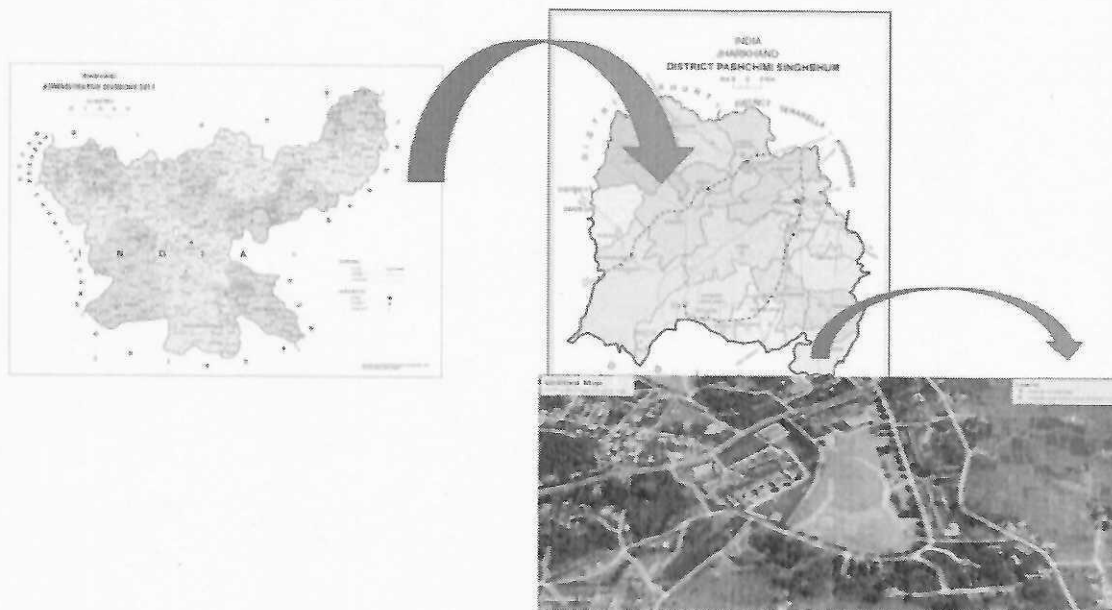
Kolhan University Chaibasa is situated in the southern part of Jharkhand. University is located at the heart of Ho land. The latitudinal and longitudinal extension of the University is 22°31'30.76"N,


Director IQAC
Kolhan University
Chaibasa


Registrar
Kolhan University
Chaibasa

85°48'51.08 E. In the South, it is surrounded by Odisha and East-West Bengal. University attracts a large number of students from neighboring states.

GEOGRAPHICAL LOCATION WITH CAMPUS MAP IN SCALE



Asai
Director IQAC
Kolhan University
Chaibasa

S
Registrar
Kolhan University
Chaibasa



PLANT DIVERSITY OF KOLHAN UNIVERSITY, CHAIBASA, JHARKHAND

Kolhan University is within the geo-position latitude 22°31'30.76"N and longitude 85°48'51.08E in Chaibasa, Jharkhand, India. It encompasses an area of 32.99 Acres. 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 programs organized by the university and have become an integral part of it. The trees of the university have increased the

S. Anand
 Director IQAC
 Kolhan University
 Chaibasa

[Signature]
 Registrar
 Kolhan University
 Chaibasa

quality of life, not only the university fraternity but also the people living in surroundings in terms of contributing to our environment by providing oxygen, improving air quality, climate improvement, conservation of water, preserving soil, and supporting wildlife 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 species of birds are dependent on these trees mainly for food and shelter. Nectar of flowers and plants is a favorite of birds and many insects. Leaf – covered branches keep many animals, such as birds and squirrels, out of reach of predators.

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 in particular. 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 periphery of the university have found to be bringing down noise and cut down dust and storms. Thus, the university campus has been playing a significant role in maintaining the environment of the entire Chaibasa town. The following are the floral diversity which is observed in the university campus:

| Sl. No. | Common Name | Botanical Name | Family |
|---------|---------------------|---------------------------------|------------------------|
| 1 | Mango | <i>Mangifera indica</i> | <i>Anacardiaceae</i> |
| 2 | Gulmohar | <i>Delonix regia</i> | <i>Royal poinciana</i> |
| 3 | Banyan | <i>Ficus benghalensis</i> | <i>Moraceae</i> |
| 4 | Sacred fig (Peepal) | <i>Ficus religiosa</i> | <i>Moraceae</i> |
| 5 | Kathal (Jackfruit) | <i>Artocarpus heterophyllus</i> | <i>Moraceae</i> |
| 6 | Mahogani | <i>Swietenia</i> | <i>Meliaceae</i> |
| 7 | Cashew tree | <i>Anacardium occidentale</i> | <i>Anacardiaceae</i> |
| 8 | Karanja | <i>Millettia pinnata</i> | <i>Fabaceae</i> |
| 9 | Litchi | <i>Litchi chinensis</i> | <i>Sapindaceae</i> |
| 10 | Indian bael | <i>Aegle marmelos</i> | <i>Rutaceae</i> |
| 11 | Custard apple | <i>Annona reticulata.</i> | <i>Annonaceae</i> |

Anai
Director IQAC
Kolhan University
Chaibasa

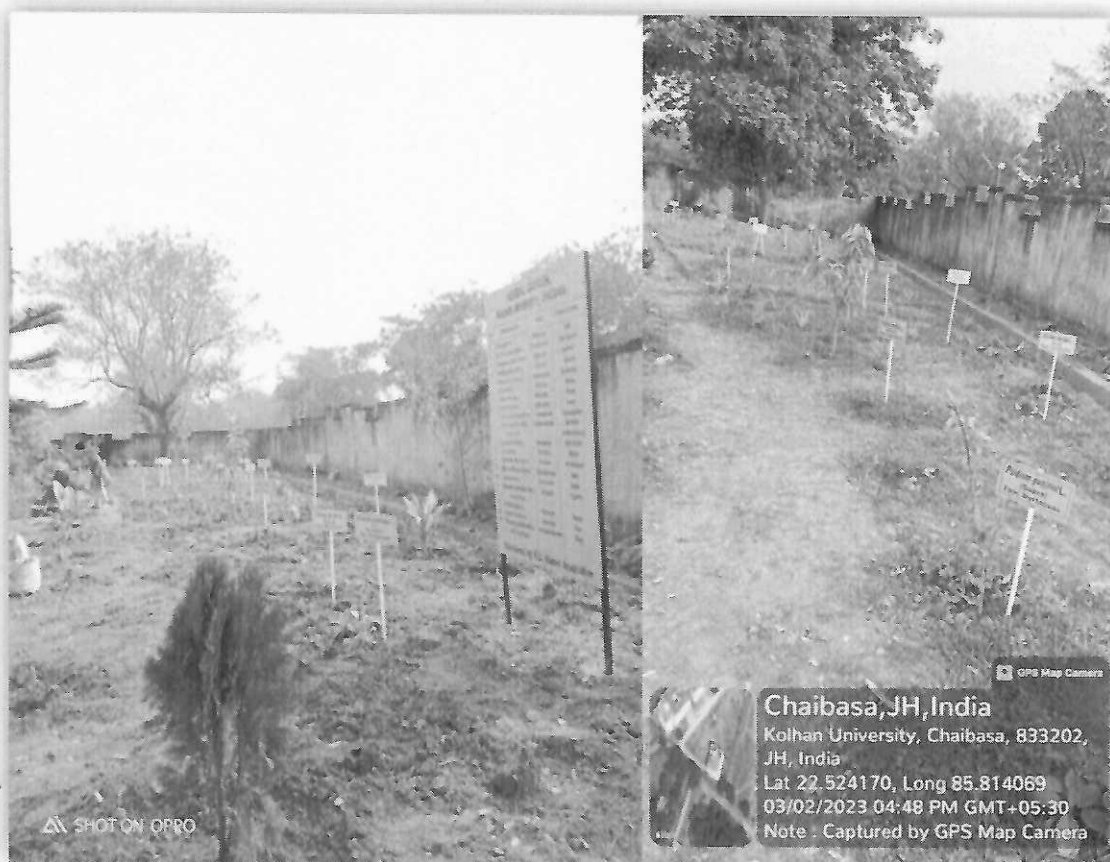
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Registrar
Kolhan University
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The university has a separate Herbal Garden in the campus near the Central Library being maintained by the Alumni Association of the university. Following herbs, medicinal and flowering plants are being maintained in the garden:

| Sl. No. | Common Name | Botanical Name | Family |
|---------|----------------|--------------------------------------|-----------------------|
| 1 | Golki | <i>Piper nigrum L.</i> | <i>Piperaceae</i> |
| 2 | Chhoti Elaichi | <i>Elettaria cardamomum L.</i> | <i>Zingiberaceae</i> |
| 3 | Dalchini | <i>Cinnamomum verum J. S. Presl.</i> | <i>Lauraceae</i> |
| 4 | Aloe vera | <i>Aloe barbadensis Miller.</i> | <i>Liliaceae</i> |
| 5 | Tulsi | <i>Ocimum sanctum L.</i> | <i>Lamiaceae</i> |
| 6 | Giloy | <i>Tinospora cordifolia (Wild.)</i> | <i>Menispermaceae</i> |
| 7 | Neem | <i>Azadirachta indica L.</i> | <i>Meliaceae</i> |
| 8 | Anar | <i>Punica granatum L.</i> | <i>Lythraceae</i> |
| 9 | Bryophyllum | <i>Kalanchoe pinnata</i> | <i>Crassulaceae</i> |
| 10 | Gurmaar | <i>Gymnema sylvestre</i> | <i>Asclepiadaceae</i> |
| 11 | Raat ki rani | <i>Cestrum nocturnum L.</i> | <i>Solanaceae</i> |
| 12 | Anjeer | <i>Ficus carica L.</i> | <i>Moraceae</i> |
| 13 | Harshringar | <i>Nyctanthes arbortristis L.</i> | <i>Oleaceae</i> |
| 14 | Amla | <i>Emblica officinalis Gaertn.</i> | <i>Euphorbiaceae</i> |
| 15 | Genda | <i>Tagetes erecta L.</i> | <i>Asteraceae</i> |
| 16 | Tejpatta | <i>Cinnamomum tamala</i> | <i>Lauraceae</i> |
| 17 | Guava | <i>Psidium guajava L.</i> | <i>Myrtaceae</i> |
| 18 | Sadabahar | <i>Catharanthus roseus L.</i> | <i>Apocynaceae</i> |
| 19 | Nimbu | <i>Citrus limon L.</i> | <i>Rutaceae</i> |

S. Arora
Director IQAC
Kolhan University
Chaibasa

S.
Registrar
Kolhan University
Chaibasa



FAUNAL DIVERSITY IN KOLHAN UNIVERSITY CAMPUS:

Kolhan University is located in Singhbhum (West) District of Jharkhand. Chaibasa is an ancient city. It has got extreme climates. December-January are the coldest months while April-May are the hottest. The highest temperature is recorded 43 °C just prior to the onset of monsoon (around May- early June). Summer rain is normal, and is principally caused from late July to August by the moisture-laden Monsoon. The Rainfall is the highest in July and August. The annual average rainfall in the entire district is about 1168 mm. South-west Monsoon generally breaks in the second week of June. The climatic condition of the Singhbhum (West) district as a whole and Kolhan University in particular is very suitable for a wide variety of flora and fauna to support its rich biodiversity. The faunal Diversity of Kolhan University campus has been studied and documented as below:

S. Rai
Director IQAC
Kolhan University
Chaibasa

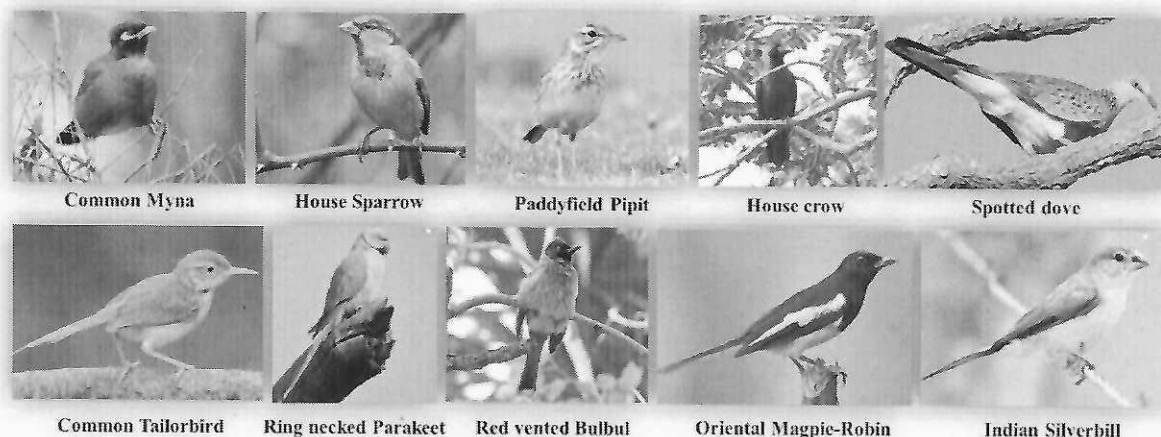
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Common and Scientific names of birds and animals sighted in the University campus

| Sl. No. | Common Name | Scientific Name |
|---------|---------------------------|-----------------------------|
| 1 | Common Myna | <i>Acridotheres tristis</i> |
| 2 | House Sparrow | <i>Passer domesticus</i> |
| 3 | Paddyfield Pipit | <i>Anthus rufulus</i> |
| 4 | House Crow | <i>Corvus splendens</i> |
| 5 | Common Tailorbird | <i>Orthotomus sutorius</i> |
| 6 | Spotted Dove | <i>Spilopelia chinensis</i> |
| 7 | Ring-necked Parakeet | <i>Psittacula krameri</i> |
| 8 | Alexandrine Parakeet | <i>Psittacula eupatria</i> |
| 9 | Black-winged Kite | <i>Elanus caeruleus</i> |
| 10 | Brown Rock Chat | <i>Oenanthe fusca</i> |
| 11 | Indian Golden Oriole | <i>Oriolus kundoo</i> |
| 12 | Indian Silverbill | <i>Euodice malabarica</i> |
| 13 | White-throated Kingfisher | <i>Halcyon smyrnensis</i> |
| 14 | Oriental Magpie-Robin | <i>Copsychus saularis</i> |
| 15 | Black Drongo | <i>Dicrurus macrocercus</i> |
| 16 | Red-vented Bulbul | <i>Pycnonotus cafer</i> |
| 17 | Scaly-breasted Munia | <i>Lonchura punctulata</i> |
| 18 | Owl | <i>Bubo bengalensis</i> |
| 19 | Snake | <i>Naja naja</i> |
| 20 | Yellow Wasp | <i>Ropalidia marginata</i> |
| 21 | Butter Fly | <i>Danaus genutia</i> |
| 22 | Dragon Fly | <i>Sympetrum flaveolum</i> |
| 23 | Honey Bee | <i>Apis indica</i> |
| 24 | Chameleon | <i>Chameleon</i> |

S. Rai
Director IQAC
Kolhan University
Chaibasa

[Signature]
Registrar
Kolhan University
Chaibasa



WEATHER DATA OF KOLHAN UNIVERSITY:

Station: Chaibasa, West Singhbhum, Jharkhand, INDIA

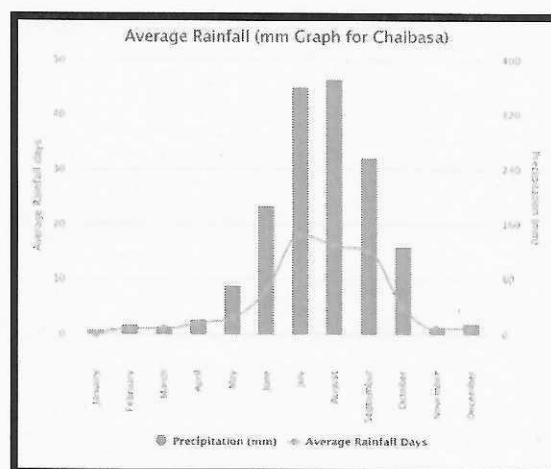
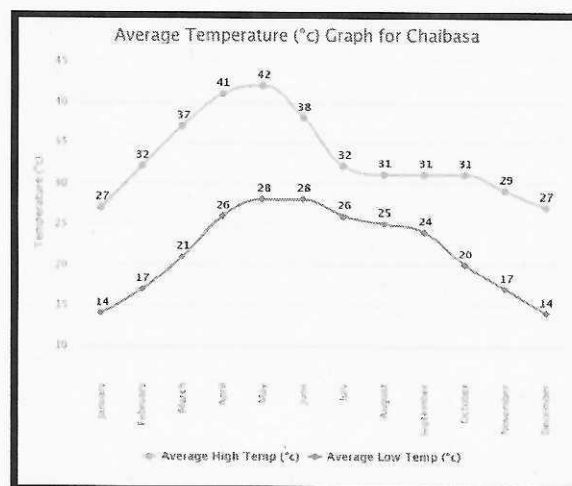
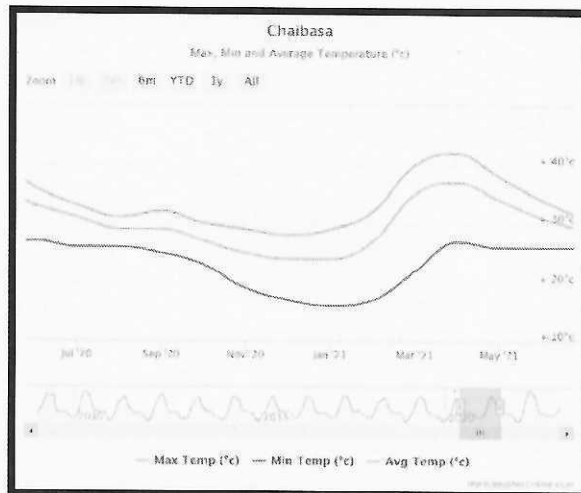
Location: 22°31'30.76"N, 85°48'51.08 E

In Chaibasa, the climate is warm and temperate. The average annual temperature in Chaibasa 37°C and precipitation level is about 335 mm.

The driest month is generally January. There is on average 6.5 mm of precipitation in January. The greatest amount of precipitation occurs in August with an average of 370 mm. With an average of 42°C May is the warmest month. The lowest average temperatures in the year occur in December-January, when it is around 14.4°C. The precipitation varies 328 mm between the driest month and the wettest month. The variation in temperatures throughout the year is 15 °C.

Arav
Director IQAC
 Kolhan University
 Chaibasa


Registrar
 Kolhan University
 Chaibasa



Asai
Director IQAC
Kolhan University
Chaibasa

[Signature]
Registrar
Kolhan University
Chaibasa

AIR QUALITY OF KOLHAN UNIVERSITY:

The ambient air quality data for Chaibasa and Kolhan University the last one year shows that there are very less polluted particles in ambient air; AQI for SO₂ & NO_x parameters are within the range of Indian living standards, there are a number of factors responsible for this cleanliness, calmness and serenity in this area. Firstly, in this area more trees have been planted as well as natural forests are present as compared to other cities in Jharkhand. Furthermore, no air polluting industry is established near here.

Therefore, the ambient air quality of Chaibasa falls in between moderate to rich quality state. However, the annual average value of PM₁₀, SO₂, NO_x in the ambient air quality of Chaibasa falls in the range of 42-55 µg/m³, 2-4 µg/m³, 8-11 µg/m³ for most of the months.

Air Quality Determination:

Satisfactory air quality index (OVERALL=140) in Chaibasa, West Singhbhum, Jharkhand, India on dated 17th March 2021:

| Parameter | Data |
|-------------------|-----------------------|
| PM _{2.5} | 52 µg/m ³ |
| PM ₁₀ | 75 µg/m ³ |
| NO ₂ | 10 µg/m ³ |
| CO | 326 µg/m ³ |
| O ₃ | 6 µg/m ³ |
| SO ₂ | 3 µg/m ³ |
| Humidity | 58% |
| Wind speed | 19 kmph |

WATER ANALYSIS REPORT OF KOLHAN UNIVERSITY:

Water quality testing is important because it identifies contaminants and prevents waterborne diseases. Drinking or using contaminated water can result in severe illness or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease. The drinking water specifications of Kolhan University is as follows:


Director IQAC
Kolhan University
Chaibasa


Registrar
Kolhan University
Chaibasa

| S. No | Parameters | Desirable Limit | Permissible Limit in the absence of Alterane |
|-------|--|-----------------|--|
| | | 6.5to8.5 | No Relaxation |
| 3. | Total Hardness as CaCO ₃ (mg/L) | 300 | 600 |
| 4. | Iron(mg/L) | 0.3 | 1.0 |
| 5. | Chloride(mg/L) | 250 | 1000 |
| 6. | Fluoride(mg/L) | 1.0 | 1.5 |
| 7. | T.D.S(mg/L) | 500 | 2000 |
| 8. | Calcium(mg/L) | 75 | 200 |
| 9. | Magnesium(mg/L) | 30 | 100 |
| 10. | Nitrate(mg/L) | 45 | 100 |
| 11. | Sulphate(mg/L) | 200 | 400 |
| 11. | Sulphate(mg/L) | 200 | 400 |
| 12. | Alkalinity(mg/L) | 200 | 600 |

TRANSPORTATION AT KOLHAN UNIVERSITY:

The KU campus, established in the lap of mother nature, is very close to the heart of Chaibasa city. The faculty, staff and students are encouraged to use cycles, EV-two wheelers and e-rickshaw rather four wheelers which are driven by fossil fuels. The university provides buses for staffs for the remotely living faculty and staff in order to reduce uses of personal vehicles which in turn favorable for the building of a clean, pollution free, green campus in KU.

ALTERNATE ENERGY SOURCES AND ENERGY CONSERVATION AT KOLHAN UNIVERSITY:

The Kolhan University campus is well equipped with modern day power facilities. University is also using solar energy as alternate energy source. In order to keep the power consumption in a limited volume, the authority-maintained LED bulbs, LED tubes and used modern day energy efficient fans in place of usual old filament bulbs or bulky high-power consuming fans. Thus, the campus is moving towards a more reliable and greener option and reducing its carbon footprints.

K. K. K.
Director IQAC
Kolhan University
Chaibasa


Registrar
Kolhan University
Chaibasa



West Singhbhum, Jharkhand, India
GRG7+6MJ, Jharkhand 833202, India
Lat 22.525592°
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S. Prasad
Director IQAC
Kolhan University
Chaibasa

S.
Registrar
Kolhan University
Chaibasa