Criterion-1: Curricular Aspects

Key Indicator – 1.3: Curriculum Enrichment

Metric: 1.3.3

Programmes:

MA Environmental Studies

M.Sc. Environmental Studies

Syllabus	**MA Environmental Studies:** https://www.du.ac.in/uploads/RevisedSyllabi1/Annexure-16.%20M.A.-M.Sc.%20Environmental%20Science.pdf **M.Sc. Environmental Studies:** https://www.du.ac.in/uploads/RevisedSyllabi1/Annexure-16.%20M.A.-M.Sc.%20Environmental%20Science.pdf
Number of Students	Annexure-I
Sample Project Reports	Annexure-II
Sample Field Work Documents	Annexure-III

Annexure-I

Number of Students

पर्यावरणीय अध्ययन विभाग
DEPARTMENT OF ENVIRONMENTAL STUDIES
दिल्ली विश्वविद्यालय
University of Delhi
दिल्ली-110007 / Delhi-110007

Ref. No. : DES/289 Dated 27/1/2024

The IQAC
Delhi University
New Delhi

Subject: Submission of Student Data and Documentation for Field Projects, Research Projects, and Internships

Dear Sir,

Please find the table below detailing the number of students who participated in the field projects, research projects, and internships for the M.A. and M.Sc. programs.

Year	M.A.	M. Sc.
2018	13	32
2019	25	31
2020	20	43
2021	26	44
2022	30	42
2023	24	33

Additionally, we are attaching the necessary supporting documents for your reference.

Thank you for your attention to this matter.

Sincerely yours,

Head of the Department

Tel. No. : 011-27667125 | Email id : office@es.du.ac.in

Annexure-II

Sample Project Reports

A REVIEW ON THE BIO-ETHAMOL POLICY IN INDIA

DISSERTATION SUBMITTED TO THE UNIVERSITY OF DELHI
IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE AWARD OF THE DEGREE OF

MASTER OF ARTS
IN
ENVIRONMENTAL STUDIES

2021-2023
May, 2023

SUBMITTED BY
SHREYA PRAKASH
(Enrollment No. 17ANDCBSB0000035)

Under the Supervision of
Dr. Bharath G

DEPARTMENT OF ENVIRONMENTAL STUDIES
UNIVERSITY OF DELHI
DELHI- 110007
INDIA

SUBSTRATES USED IN MICROBIAL ELECTROLYSIS CELLS (MECs) FOR SUSTAINABLE HYDROGEN PRODUCTION: A REVIEW

DISSERTATION SUBMITTED TO THE UNIVERSITY OF DELHI
IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE AWARD OF THE DEGREE OF

MASTER OF SCIENCE
IN
ENVIRONMENTAL STUDIES

2020-2023
May, 2023

SUBMITTED BY
ANJU YADAV
(Enrollment No. 20DENVMSE000001)

Under the Supervision of
Dr. Bharath G

DEPARTMENT OF ENVIRONMENTAL STUDIES
UNIVERSITY OF DELHI
DELHI- 110007
INDIA

WASTE COOKING OIL AS A FEEDSTOCK FOR BIODIESEL PRODUCTION IN INDIA: EVALUATING SUSTAINABILITY, CHALLENGES, AND OPPORTUNITIES

DISSERTATION SUBMITTED TO UNIVERSITY OF DELHI IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF SCIENCE

IN

ENVIRONMENTAL STUDIES

2021-2023 (MAY 2023)

SUBMITTED BY

DARSHAN KUMAR J V

(Enrollment No: 21DENVMSES000001)

Under the mentorship of

Dr. Bharath G

DEPARTMENT OF ENVIRONMENTAL STUDIES

UNIVERSITY OF DELHI

DELHI-110007 INDIA

A DESCRIPTIVE REVIEW OF INDIAN BIOFUEL POLICIES

DISSERTATION

SUBMITTED FOR THE PARTIAL FULFILMENT FOR THE AWARD OF DEGREE OF MASTER OF ARTS IN ENVIRONMENTAL STUDIES

SUBMITTED BY

SUMIT KUMAR

UNDER SUPERVISION OF

DR. BHARATH G

DEPARTMENT OF ENVIRONMENTAL STUDIES

UNIVERSITY OF DELHI,

DELHI-110007

2020-2022

Unveiling the Green Hydrogen Policy Landscape: Evaluating Implementation Approaches, Economic Implications, and Environmental Benefits

Dissertation submitted in partial fulfilment for the degree of

MASTER OF ARTS

IN

ENVIRONMENT STUDIES (2021-2023)

Under the supervision of

Dr. Bharath G.

Assistant Professor

Department of Environmental Studies

University of Delhi

Delhi – 110009

Preeti Kumari

(Enrollment No. 17MIRHBGLS000027)

Department of Environmental Studies

University of Delhi

Potentially Toxic Elements (PTEs) scenario in water resource of Urban Delhi

Dissertation submitted towards partial fulfillment of the Degree of

MASTER OF SCIENCE

(ENVIRONMENTAL STUDIES)

(2021-2023)

RISHIKA

Roll no. 21218750026

DEPARTMENT OF ENVIRONMENTAL STUDIES

UNIVERSITY OF DELHI

DELHI-110007

MAY, 2023

Growth of Renewable Energy Sector in India: A Review

University of Delhi

DISSERTATION

Submitted in partial fulfilment of the degree of

Master of Arts in Environmental Studies

By

Sachin

Department of Environmental Studies

University of Delhi

Delhi-110007

Date- 10/05/2023

A REVIEW OF THE SUBSTRATES USED IN MICROBIAL ELECTROLYSIS CELLS (MECs) FOR SUSTAINABLE HYDROGEN PRODUCTION

DISSERTATION

SUBMITTED TO UNIVERSITY OF DELHI

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF ARTS

IN

ENVIRONMENTAL STUDIES

2020-2022 (MAY 2022)

SUBMITTED BY

SWATI KUMARI SHARMA

(Enrollment No: ENVI20218709022)

Under the mentorship of Dr. Bharath G

DEPARTMENT OF ENVIRONMENTAL STUDIES

UNIVERSITY OF DELHI

DELHI-110007, INDIA

INTRODUCING SUSTAINABLE DEVELOPMENT GOALS TO ECOCRITICISM OF CLIMATE FICTION

UNIVERSITY OF DELHI

DISSERTATION

Submitted in partial fulfilment of the degree of

Master of Arts in Environmental Studies

By

NEELAKSHI THAKUR

DEPARTMENT OF ENVIRONMENTAL STUDIES

UNIVERSITY OF DELHI

DELHI-110007

04/05/2022

WATER QUALITY ASSESSMENT OF URBAN WATER BODIES WITHIN DELHI CITY

Dissertation submitted towards the partial fulfillment for the Degree of

MASTER OF SCIENCE

IN

ENVIRONMENTAL STUDIES

(2020-2022)

CHAITANYA RAJ

DEPARTMENT OF ENVIRONMENTAL STUDIES

UNIVERSITY OF DELHI

DELHI-110007

INDIA

MAY, 2022

The Hidden Gold of Himalaya: Yartsa Gunbu

University of Delhi

DISSERTATION

Submitted in partial fulfillment of the degree of
Master of Science in Environmental Studies

By
Lhakpa Tsering

Under the supervision of
Dr. Gyan Prakash Sharma

Department of Environmental Studies
University of Delhi
Delhi-110 007

May 2018

TO STUDY THE EFFECT OF *Prosopis Juliflora* ON SOIL AND NATIVE VEGETATION IN KAMLA NEHRU RIDGE

DISSERTATION
SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE AWARD OF THE DEGREE OF

MASTER OF SCIENCE
IN
(ENVIRONMENTAL STUDIES)

Submitted by
ROMIT ANTIL

DEPARTMENT OF ENVIRONMENTAL STUDIES
UNIVERSITY OF DELHI
DELHI-110007
MAY, 2019

UNDERSTANDING THE IMPORTANCE OF FOREST IN TRIBAL COMMUNITIES AND THE IMPACT OF LAWS ON THE TRIBAL COMMUNITIES

Submitted in partial fulfilment of the requirements for a degree in M.A. (Environmental studies)
University of Delhi

MASTER OF ARTS
ENVIRONMENTAL STUDIES
(2016-2018)

AAKANCHHA

DEPARTMENT OF ENVIRONMENTAL STUDIES
UNIVERSITY OF DELHI
DELHI-110007
MAY 2018'

A COMPARATIVE STUDY IN THE ECOLOGICAL FOOTPRINT OF MANSIONS/BUNGALOWS OF SHAHJAHANABAD AND NEW DELHI

Dissertation submitted in partial fulfilment of the degree of

MASTER OF ARTS

IN

ENVIRONMENTAL STUDIES

2017-2019

UNDER THE SUPERVISION OF

Dr: MAYANK KUMAR

SUBMITTED BY

SHWETA GAUTAM

Department of Environmental Studies

University of Delhi

Delhi-11007

May 2019

Annexure-III

Sample Field Work Documents

Visit to

KANHA NATIONAL PARK

Department of Environmental Studies,
University of Delhi

Index

Letter of Thanks

The students would like to thank **Prof. Abdul Jamil Urfi, Head of Department**, Department of Environmental Studies, University of Delhi for providing a wonderful opportunity to go on an educational trip to Kanha tiger Reserve, Mandla, Madhya Pradesh. The visit was made possible with the joint efforts of **Prof. Abdul Jamil Urfi, Prof. Vandana Mishra, Dr. Shailender Kumar Verma and Dr. Atinderpal Singh**. The students wish to show their gratitude for the academically enlightening and enriching experience.

Preview

The masters students (MA and MSc.) of department of environmental studies, University of Delhi went on an educational trip to Kanha National Park in Madhya Pradesh. The aim of the trip was to develop sustainability managers and conservationists by giving an opportunity to interact with forest rangers, Indian Forest service officers, and people who have spent a lifetime working for wildlife conservation.

The first day of the trip was a visit to State Forest Research Institute (SFRI), Jabalpur, Madhya Pradesh and SFRI nursery. In the second half of first day students went to Narmada river Gwarighat bank to observe the riverine culture.

On day 2 the students were taken on a safari in Kanha Tiger reserve where they were able to develop an understanding on structure and function of a forest ecosystem, specially the Sal forest ecosystem. Students spotted the native floral and faunal species of Satpura region of Madhya Pradesh. The main attraction of safari was the majestic tigress and her three cubs which was a rare sighting; Leopard; Barasingha; Asian Paradise Flycatcher, the state bird of Madhya Pradesh; Madhuca Indica, commonly called as Mahua tree; among many others. The students also got to know about non-invasive BOMA technique of capturing animal for translocation. They visited the museum that was located within the premises of Kanha National Park. After safari there was a talk by Mr. S.K. Singh, Field Director of Kanha National Park and Deputy field Director Nitender Sachkhare on the success story of Kanha National Park model of eco tourism. The talk was accompanied by a demonstration by storm, a wildlife trained sniffer dog at Khatia eco-center.

Third day started with nature trail with Shri Mitendra Kumar Chichkede, Assistant Director (Sijhora). In the second half the students got an opportunity to interact with EDC members of Village Kutwai and they participated in eco-samiti of the village followed by a documentary screening at Khatia amphitheater.

On the last day of the trip students visited Dhuandhar falls known for it geological marvel to witness its enticing geography.

Day 1: State Forest Research Institute, Jabalpur visit

Students reached Jabalpur Railway station at 11 am and from there they went to **State Forest Research Institute (SFRI), Jabalpur**. **Dr. Uday Homkar**, Senior Research Officer & Division In-charge, Conservation Division, SFRI; **Dr. Aniruddha Majumder**, Scientist 'B' and Division In-charge, Animal ecology division; **Mr. Ashish Chauhan**, Range Officer; **Dr. Sushil Upadhay,** Deputy Director Regional cum Facilitation centre NMPB, SFRI gave a brief introduction about the major goal of the institution.

It was followed by demonstration of **Miyawaki technique** which is a method of growing urban forest quickly in a limited area using native floral varieties. It is focused on improving vertical growth of the trees in the forest finally culminating to a multi layered forest.

The officers told the students about **Non-Timber Forest products (NTFPs)** that are obtained from the forest such as Mahua (*Madhuca indica*), Palas (*Butea monosperma*), Chironji, Harra (*Terminalia chebula*) etc. The importance of these plants were explained to the students. For example, Mahua tree is a source of livelihood for many tribes. To prevent its overconsumption a limit on collection of forest produce is prescribed.

Assisted Natural Regeneration (ANR) is a set of methods used to assist faster growth of trees is adopted in many activities of SFRI. A brief discussion on **Rare Endangered threatened (RET)**

species was also conducted. Species like *Sterculia urens* are native to the region and they should be planted while conducting plantation drives.

The **nursery** represented one of the 11 agro climatic zones. It maintained about 450 species of medicinal plants. The students visited poly-house having wide variety of plant species like Safed

Root Trainer for better growth of roots that can hold soil as soon as they are planted in the field. These root trainers help in air pruning of the plant roots so that they get adequate amount of air

Chandan (*Tantalum album*), *Embelica officinalis*, Shehtoot (*Morus alba*), Mahua (*Madhuca latifolia*). The nursery visit was followed by museum tour. The Vermicomposting practices in SFRI was another intriguing spot for students to explore.

Vermicompost

The **museum** housed many varieties of seeds including one of the largest seeds of *Entada scandens*, a legume. There was a life size model of sal borer (*Hoplocerambyx spinicornis*), a beetle species known to infest sal tree. They were the cause of 1996 epidemic that wiped out a large number of sal trees. Dr. Uday Homkar told some interesting facts about the ways adopted to deal with sal borer and how local participation is sought. He also explained the role of SFRI in training locals for

adopting good agricultural practices such as using grafting methods for collection of forest produce and good storage methods to prevent fungal infection.

After the field visit the students got an opportunity to interact with **Amitabh Agnihotri,** IFS, **Director SFRI** & PCCF and **Ravindra Mani Tripathi,** IFS, Dy. Director SFRI**.** He spoke about the **five phases of forestry** research right from 1920 to today. He then explained about the **administrative setup** of the organisation which constitutes of two main bodies- Board of Governors and Research advisory committee. Projects undertaken by SFRI including **Bamboosetum** construction was another highlight of the talk. While referring to Madhya Pradesh as the tiger state of India he gave a brief about the success story of Kanha National Park as well as Panda National park. In the latter case Tigers went from 0 to 60 in number. He also talked about how 2 tiger cubs helped reintroduction of tigers in Nauradehi Tiger reserve. Madhya Pradesh is also the Leopard state of India which was another focal point of his talk. Other animal conservation plans including Gharial conservation and Vulture conservation were also discussed by him. He then talked about success story of Bandhavagrh Tiger Reserve where gaur, the largest Bovine species flourish today and Population Viability analysis of Barasingha in Bandhavgarh. Role of public

participation in context of Pardi community was also explained by him. He concluded by summarising the role of SFRI as a trio of Training, Research and consultancy in wildlife conservation and management.

Day 1: Gwari Ghat Narmada Bank Visit

From SFRI, the students were taken to Gwarighat, a small town on Narmada where the learning objective was to understand the **riverine culture**. Narmada is sacred for Hindus, also called Shiv-putri or Shiva's daughter, and that was visible on the river front with several temples playing holy songs. Gwarighat is also used a cremation site by Hindus due to their belief., that last rites here opens up doors of heaven for the departed. There is also a temple dedicated to river Narmada. A Sikh Gurudwara (temple) is also situated on it. According to the local legend, at this place many sages had performed meditation. Evening aarti (fire salutation) is a tourist attraction. Our Former President had also visited this place during his tenure while on a tour to Jabalpur. Rivers have been the backbone of civilisation across the globe, providing water, the most essential element needed to sustain life; but in India, rivers are revered more than just a water source. They are worshipped like goddesses since yore times. Today, amidst commercialisation and arrest of human psyche, markets

Gwarighat - Narmada River bank

have sprung up everywhere near a holy place. **Economic activity** drives even temples and activities like boating, restaurants and shops, and photography were happening there as well.

Day 2: Safari at Kanha National Park

Students on Safari

Safari was scheduled early in the morning at 6 am. It was not just the students who were eager to go for safari, there were hundreds of tourists, sitting with their paraphernalia in lined up vehicles. This, along with the electrical wires inside the core zone of the park showcased the interface between several tech like electrification and transport happening in these protected forests.

The fleet of jeeps didn't have to wait even minutes into the forest that an avenue of huge Sal trees welcomed tourists into the forest. Air quality was so fresh and crisp that lungs become full of gratitude. Gypsy number 79 became the luckiest of all with their first sighting in the park of an animal too shy and rare for tourists-a chubby leopard. For seconds students were in wonderment, too amazed to even reach out for camera to click a picture, and the animal was too timid to move and they both stood still. Thankfully, a student managed to shoot the feline from back. Mammals

like spotted deer or chital, swamp deer aka barasingha; the State animal of Madhya Pradesh, Indian jackal, langurs, gaur, and wild pig were spotted. Among the 300 bird species of Kanha, Indian peafowl, lesser egret, red junglefowl, Indian roller, spotted dove, and green bee-eater were easily spotted. The adrenaline rush skyrocketed when guides heard monkey alarm call, tigress Neelma was on the move with her three cubs. All the jeeps in the Kanha core region rushed towards the spot; the tigress walked majestically along with her three cubs, unimpressed by the crowd. The tour guide and the Gypsy driver told many stories related to tiger behaviour; they divulged how a tiger mom is sometimes suspected to kill the weaker of her progenies to adjust the litter size and ensure better survival of her kids. The tigress was taking her cubs to the area where she had hid her kill, she went through a passage in the mesh-wire enclosure once used to assist Barasingha breeding, one of her cubs could easily follow her through it, but two of them got lost and they hid under the bushes. A tiger cub in this situation has two options; either to call out mom for help or stay hidden (for as long as two days) until mother comes and finds it. But, the litter of tigress Neelima is full of brave hearts; the little ones came out one after the other, and even though they were visibly frightened, they still made their way out of the situation and joined their family.

Next stop of the day was the **Interpretation Centre**, perched in the middle of the forest, a quaint clearing with hut-shaped beautiful structures that housed a cafeteria, two museums and a sound show room. Next students met Mr. Sanjeev Sharma**.**

Range Officer Mr. Sanjeev Sharma explained problems and issues in biodiversity conservation. In 1968, only 63 barasingha were left in the world. It takes 48 hours for the young one of this deer to stand and walk, as a result predators were playing havoc on their already dwindling numbers. Park authorities were challenged and officers like **HS Pawar**, first Director of Kanha after Project Tiger and **MK Ranjit Singh** decided to change this situation and they came up with the idea of making big enclosures in the grasslands where a small population of these animals including the expecting mothers were to be kept till their young ones grew up to help revive the numbers. Mr. Sharma, along with other officials, showed us how **Boma technique** has been used to capture barasingha without tranquilliser and translocate them to save their small population from infectious diseases in Kanha. A funnel-shaped enclosure is created to gather the antelope which is connected to a truck and the entire process takes only four to five minutes to finish. Today there are about 1127 hard-brown swamp deer in Kanha National Park and over hundreds have been shifted to Van Vihar, Bhopal and Satpura Tiger Reserve.

Mr. Sharma also educated students with the basics of **habitat management** that needs -water, food and space as fundamental elements. He told how a **water source** is maintained in every **2*2 sq. Km** grid area.

He also talked about the artificial grasslands of Kanha, which have been planted with shrubs and grasses in places which were cleared by villagers for agriculture before eviction. How fire is used to burn unpalatable grasses during winters was also explained by Sir. He also gave an insight into the environmental governance and conservation efforts done by the park.

After this, students had a meeting with **Field Director Mr. SK Singh**. He started the address with the history of the park and how the park was a game reserve before the Wildlife Protection Act, 1972 and Project Tiger, 1973 gave government great powers to manage these forests. Sir threw some light on the economics of the park revealing that park attracts over **97 lakh tourists** every year from across the globe and that the park generates approximately 240 crores each year. More than a thousand people are involved in park management and they make use of technology like MSTripes app. Measures taken to fight the vagaries caused by climate change in terms of high temperature and resultant forest fires were also explained. **Ghorela Tiger Enclosure** in Kanha is used as tiger rewilding centre and since 2005-06, 11 tiger cubs have been rewilded. The session lasted longer than it was intended because curious budding environmentalists, scientists and conservationists from the University of Delhi kept asking question after question to satisfy their quench for knowledge. Students asked things like the causes of tiger mortality in the park and found that the main reason is territorial fights among tigers themselves. Another question was about poaching practices inside the tiger reserve to which they were told that such activities are very less due to high alertness of the authorities. Students even asked about the success rate of BOMA technique in animal translocation program.

Students were also introduced to the **sniffer dog named Storm** of the Forest Department who has been trained to detect hundreds of articles of wildlife trade. His instructor demonstrated a glimpse of his skills with a rather simple but amazing trick of locating a handkerchief without any contact but by only sniffing the ground.

Storm the sniffer dog and the trainer

Eco- center Kahtia

Day 3: Nature trail

After a safari in the 'Kanha' core region of the park, the next day began with a brisk walk along the Nature Trail-Khatia route. The students were divided into teams of two and one of them was guided by Sir Phagan Singh and the other was accompanied by Mr. V.K Jyotisi and deputy field director Nitender Sachkhare. The first question he put forward was, do you know which tree is the most abundant species here? Evident by the characteristic green hue of the forest we knew it was – Sal (*Shorea robusta*).

Left to right: Sir. J.S Baghel, Sir Prem Narayan, Dr. Shailender, Sir Phagan Singh

The evergreen tree which imparts shades of captivating green throughout the year. He told us about the cultural, social, and economic significance of Sal, how the hardwood was an asset for the colonial rule in its establishment as an empire. Huge parts of Sal forest across India were cleared for trade, construction and railways.

The seeds are light and winged resembling helicopter blades that aid in better seed dispersal mechanism using wind as the medium. The soil composition of Madhya Pradesh is ‘kaliya kanhaar’ or black clayey soil which facilitates the growth of Sal. The gum of the tree is highly inflammable and is used as an incense for rituals. Tribes of the region revere Sal as sacred. An ecological relationship of Commensalism was observed between Sal and orchid wherein the tree remains neutral but the orchids derive nutrition and shelter from the bark without harming it.

Sir V.K Jyotisi

FLoral diversity of Kanha

Sir Phagan Singh enthusiastically introduced us to the terrestrial diversity of Kanha we encountered in detail. He pointed at *Buchanania lanzan* vernacular names Char, Achar or Chironji whose dry fruits are used by indigenous people for various purposes. He told us how Gilchi (*Casearia graveolens*) is a delicacy for Gaur (*Bos gaurus*) after having a hearty meal of Haldu leaves. Terminalia tomentosa, 'one of the quartet of Ayurveda for the genus Terminalia,' the other being T. arjuna which is used to make herbal tea, T. chebula and T. bellirica. The guide recalled how Saja (*Terminalia elliptica*) as a sacred species gives indication for sowing seeds in the fields, when water droplets form on the bark the tribes witness this phenomenon and begin sowing. The bark is coarse, straight and grained resembles a crocodile's skin. The forest also supports few instances of unusual interspecies friendships like those of langurs and cheetals, the former helps the latter by making alarm calls when a predator is around, they also intentionally drop some leaves of the trees they feed on for the deer to gorge upon. A peculiar trunk was spotted which depicted animal behaviour of Sambar and Cheetal, Sambar scratches only one side while the latter scratches all around the trunk at lower heights.

These herbivores are able to browse on leaves only for a little while as the trees begin releasing toxins as a defence mechanism which make the leaves bitter thus preventing over browsing.

The next tree that we identified was of Mahua (*Madhuca indica*) a vital commercial tree for tribes across India, including the Baigas. Mahua is an ayurvedic tree, its flower sought by both humans, to make majorly toddy a local fermented drink and by bears which often results in man-animal conflict in search for a common resource. This endemic species is now on the verge of endangerment due to overexploitation.

Male Tiger pug mark

The soft clayey ground preserved fresh pugmarks of a tiger astonishingly quite near to our lodging, indicating his movement along the trail. "These are from the previous night," remarked Mr. Phagan Singh. He saw the bewilderment on our faces and went on to add how tiger is a reclusive animal and in places like Kanha they almost never attack humans. We were relieved to hear that nonetheless. He spotted a Tendu tree next and expressed its

importance in making locally produced cigarettes (beedi) in India. It is also known as cobra tree due to the rhombus scaly bark.

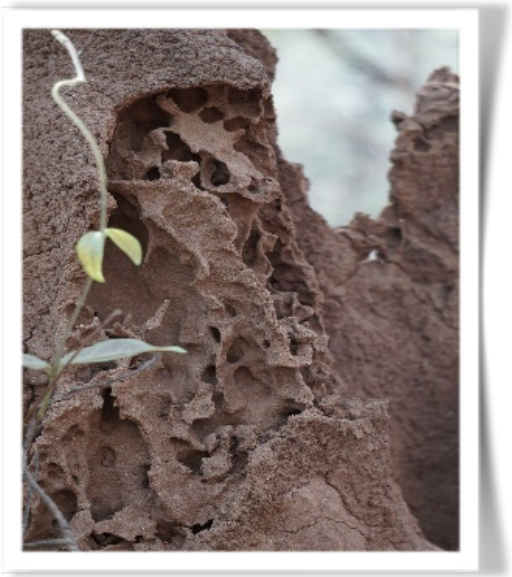
We also identified *Cassia fistula* local name amaltas, Ficus, *Careya arborea* that is bandar Ladoo.

The undergrowth of the forest floor is where several micro and macrofauna dwell. These creatures help in nutrient recycling, pollination, and soil enrichment. Like Fungi which helps in carbon sequestration and offsetting the release of green house gases to the atmosphere.

Fungi: Microporus xanthopus

One of them is termite. The guide went on to explain how snakes do not make homes and is a myth that termite mounds are mistakenly identified as snake homes. Termites became our next topic. He made us revise how termite community works with a queen and workers, forest security personnel Mr. Prem Narayan added that when a queen senses a coup she uses pheromones to cull this retaliation and hence opposition in the colony. They are not just an overlooked wonder but they also play an essential role in soil health and ecosystem ecology by litter decomposition and soil nutrient distribution. Our guide informed us about the durability of the mounds although delicate in appearance are resilient to withstand storm and sun. The mounds are constructed from a concoction of saliva, soil, and termite dung. Although solid the structure is porous,

Termite mound



this ingenuity regulates temperature in hot and cold seasons alike. This design has been imitated by many architects around the world. Every colony contains 2-2.5 lakh workers and the queen can live up to an average of 25-30 years under ideal climatic conditions.

Porous structure inside the mound

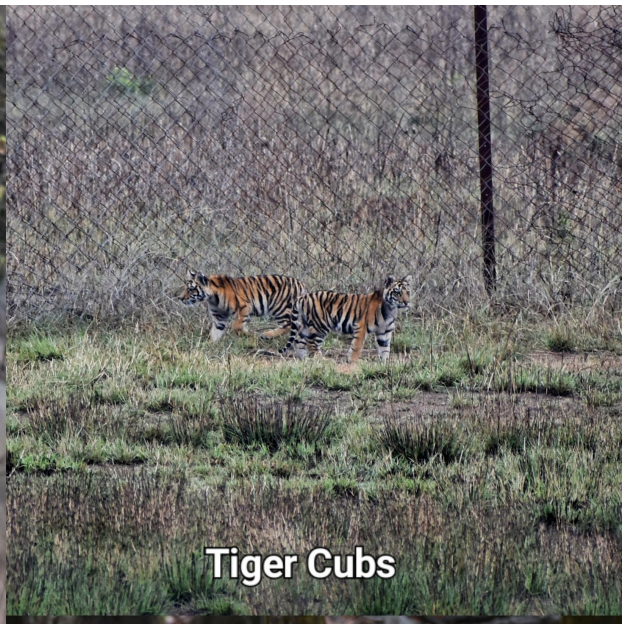
As the walk progressed, pollinators like the blue Mormon, Indian spot swordtail, Common pansy, Common sailor, chocolate pansy and tricolored marsh hawk dragonfly were seen in flight. In our hike of about 6 km, we spotted avifauna like Rufous treepie, Paradise flycatcher (State bird of Madhya Pradesh), Red-vented bulbul, Black-hooded oriole, Indian pond heron, Greater coucal and the Great racket-tailed drongo, etc. We also walked along the dry riverbed of Ghaghar, one of the tributaries of Banjar River. The sediments glistening with mica under the sun.

When the tour terminated, not only were our lungs rejuvenated but our minds were stimulated by all that we had learned on the trail. A forest as an ecosystem cannot stand on trees along, it is a synergy of all the areas. All of whom interact with each other and give rise to an ecosystem, from the light attenuated through the trees to the termite mounds all form the bigger portrayal of a forest.

Birds of Kanha National Park

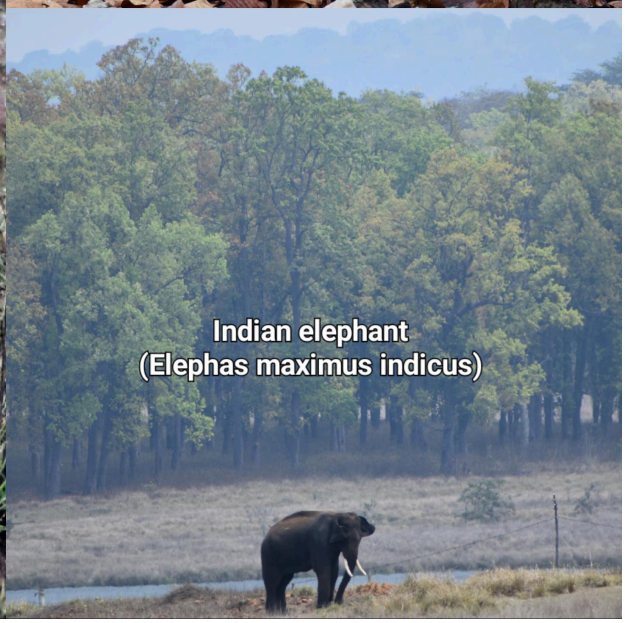

Blue Mormon
(Papilio polymnestor)
Indian Spot Swordtail
(Graphium nomius nomius)
Oriental Common Sergeant
(Athyma perius perius)
Chocolate pansy
(Junonia iphita)
Tricolored marsh hawk
(Orthetrum luzonicum)
Indian Spot Swordtail
(Graphium nomius nomius)
Ditch jewel
(Brachythemis contaminata)


Indian peafowl (Pavo cristatus)


Tiger Cubs


Grey langur (Semnopithecus)


Asian green bee-eater (Merops orientalis)


Indian elephant
(Elephas maximus indicus)

Fauna of Kanha National Park

Fauna of Kanha National Park

Day 3: Kutwahi village Eco development Council (EDC) visit and Documentary

Eco Vikas Samiti Community Centre, Kutwahi

Patrolling a stretch of 940Km^2 of the reserve is a mammoth task achieved not just by the officials but by the vigilance of the public alike. Leading by example of the Eco Vikas Samiti, the people of Kutwahi welcomed the students with open arms to share their knowledge. The fraternity was formed as an initiative of community mobilization wherein public participation is encouraged with a common goal of local ownership and sustainability of resources. There are 3 communities mobilised at different key areas:

- Van samiti – near high density forest
- Gram Van samiti – near low density forest
- Eco Vikas samiti – near tiger reserves

The Eco Vikas samiti works as an autonomous body under the forest officials, led by a Chairmen and Vice Chairman with both genders actively taking equal roles. They have obligations like forest

guards and safeguard the jungles of their zones. The villagers of the region earn their livelihood through farming and foraging forest produce like Tendu leaves and Manhua flowers.

Education of primary years are imparted locally in a recently constructed school; the inhabitants emphasize on women empowerment and equal opportunities.

Students with the samiti

Sitting cross legged on the ground, connected in harmony as one brought forth a spirit of togetherness in the interaction. After the session, the community was kind enough to give us a tour of their homes and the village. Delighting the students and coordinators alike with the simple life and vibrant hues a much-needed sight for sore eyes. Reconnecting and reliving the calm of the olden days.

The final activity of the third day was **documentary screening at Khatia amphitheater**.

Settlements of the village

Day 4: Dhuandhar waterfall visit in Bhedaghat

Bhedaghat is a city in the Jabalpur district of Madhya Pradesh, India. Located on the banks of the Narmada River, the city is known for its scenic natural beauty and unique geological formations. Some of the geological features that make Bhedaghat that were observed during the visit are as follows:

Marble rock: Bhedaghat's most impressive geological feature is its marble cliffs. These are white marble cliffs that rise up to 100 feet on either side of the Narmada River. Marble Rock is a popular tourist destination and he is considered one of India's natural wonders.

Dhuandhar Waterfall: Dhuandhar Waterfall is another geological feature that makes Bhedaghat so important. These are a series of waterfalls on the Narmada River, where the river narrows and plunges into a gorge. The waterfall is surrounded by craggy rocks and cliffs, and the mist created by the falling water gives it the name 'Dhuadar', which means 'like smoke'.

Fossil: Bhedaghat is also known for millions of years old fossils. The town is located in an area that was once covered by shallow waters, and the fossils found here provide valuable insight into the geological history of the area.

Limestone deposits: The area around Bhedaghat is rich in limestone deposits used for building and road construction. Limestone is also used to make cement.